

World War I

The assassination of the Austrian archduke Franz Ferdinand in Sarajevo in 1914 proved to be the spark that ignited World War I (1914-18). Called "the Great War," it quickly came to involve all the great powers of Europe and eventually most countries of the world, and cost the lives of more than 8 million soldiers. Among the causes of the war were rising nationalist sentiment (manifested both in the chauvinism of the great European powers and in the unrest among the subject peoples of the multinational European empires), colonial and economic rivalries, the formation of hostile alliance systems, and arms races, all of which contributed to the growing sense of international tension during the prewar years.

EUROPE ON THE EVE OF WAR

Evolution of the Alliances

The Franco-Prussian War of 1870-71 had left Germany the most powerful nation of Continental Europe. France, forced to cede the province of Alsace and part of Lorraine and to pay a large indemnity to Germany, had nonetheless recovered quickly and by 1914 was second only to Germany among the Continental powers.

During the late 19th and early 20th centuries the crumbling Austro-Hungarian Empire was plagued with continuing internal unrest among its many nationalities. The desire of many of the Slavs in the southern provinces to join neighboring Serbia had intensified friction among the empire's Germanic, Magyar, and Slavic peoples. The Austrians nevertheless hoped to increase their strength and territory in the Balkans at the expense of the disintegrating Ottoman Empire. They thereby antagonized Russia, which also hoped to absorb much of the Ottoman territory.

Russia, although the largest nation in Europe, was in some respects even weaker than Austria-Hungary. In addition to its staggering defeat in the Russo-Japanese War (1904-05), tsarist Russia was also plagued by revolutionary unrest and industrial backwardness.

These conflicting national interests led to the creation of two rival alliance systems. In 1879, Germany's chancellor, Otto von BISMARCK, concluded a defensive accord with Austria-Hungary against Russia. Within three years Italy, a rival of France in the Mediterranean, had joined Germany and Austria-Hungary to create the TRIPLE ALLIANCE. Germany and Austria agreed to support Italy in the event of an attack by France, in exchange for Italian agreement to remain neutral in case of war between Austria-Hungary and Russia.

Bismarck, who feared the possibility of an alliance between France and Russia against Germany, sought to prevent it by concluding (1887) a Reinsurance Treaty with Russia. He also attempted to maintain friendly relations with Great Britain. In 1890, however, young Emperor WILLIAM II dismissed Bismarck from the chancellorship. He allowed the Reinsurance Treaty to lapse, and in 1894, Bismarck's fear became a reality with the formation of a Franco-Russian alliance. William, moreover, soon aroused British suspicions by his imperialistic policies and by his intensified effort to build up the German fleet, threatening Britain's position as the dominant European naval power. This situation led to the formation of the Anglo-French Entente in 1904. By supporting Austrian ambitions in the Balkans, William also further embittered Russia, which in 1907 concluded an entente with Britain. Thus Britain, France, and Russia, previously fierce rivals in colonial expansion, came together in the TRIPLE ENTENTE.

Several smaller countries became indirectly involved in the alliances, dividing Europe into two armed camps. In order to prevent further Austrian expansion into the Balkans, and out of sympathy with what was regarded as a "little Slavic sister," Russia pledged to aid Serbia in case of war with Austria-Hungary. Belgium was in an anomalous position because its neutrality had been guaranteed (1839) by Britain, France, Russia, Prussia (Germany), and Austria.

Armed Forces

All the major European powers except Britain had conscript armies by 1914. The German army was by far the best trained and equipped, and it was directed by a highly efficient general staff. In the wake of the German victory in the Franco-Prussian War, the other European countries had also attempted to develop efficient staff systems. Moreover, all these general staffs had prepared war and mobilization plans to meet all possible combinations of opponents. The French, whose army was ranked second only to the Germans in overall efficiency, had one basic deficiency: their war plans and all of their military training were focused on the offensive to the total neglect of defensive tactics. The Austrian and Russian army systems were, in general, poor copies of the German and

French, respectively. Britain's small volunteer army was well trained, but British war strategy focused on the Royal Navy, the largest sea force in the world.

The buildup of the German fleet alarmed the British, who would be starved into submission if a hostile navy were to prevent British merchant ships from delivering food. Thus, as Germany's navy grew, so did Britain's. The Royal Navy of 1914 was primarily the creation of Adm. Sir John Fisher (later Lord FISHER OF KILVERSTONE), first sea lord from 1904 to 1910. He had introduced (1905) the DREADNOUGHT battleship, with its ten huge guns. He had also developed the battle cruiser, which combined the power of eight of these big guns with the speed of the cruiser. The other navies of the world, including the German, followed the British lead and concentrated on big ships with big guns. Britain, however, kept ahead.

Most of the Royal Navy was concentrated in the waters around the British Isles, organized in the Grand Fleet or the Home Fleet, under the command of Adm. Sir John Jellicoe. Ultimate control, however, was exercised by the lord commissioners of the Admiralty, headed by a civilian official, the first lord of the Admiralty. In 1914 this position was held by Winston CHURCHILL.

In Germany the emperor was commander in chief of all the armed forces. His secretary of state for the navy, Grand Adm. Alfred von TIRPITZ, had directed the expansion and modernization of the German fleet. Most of the ships of the German navy were organized as the High Seas Fleet, commanded by Adm. Friedrich von Ingenohl. The fleet was based primarily at Wilhelmshaven on the North Sea and at Kiel on the Baltic. Wilhelmshaven and the other German ports on the North Sea were well protected by the heavily fortified island of Heligoland and a series of minefields. Behind that screen, German ships could seek even greater security by passing through the Kiel Canal into the secure waters of the Baltic Sea.

Although the German navy could not match the numerical strength of the British fleet, German ships were more modern and in some respects tougher, more powerful, and more maneuverable than Britain's. Nonetheless, when World War I broke out, the Royal Navy controlled the seas with 28 dreadnoughts and battle cruisers to Germany's 18.

Germany in 1914 had fewer submarines than Britain, and as yet had no concept of how they could best be used. Germany had, however, a number of large airships, or dirigibles—also called Zeppelins after their inventor, Ferdinand, Graf von ZEPPELIN. These huge, rigid, lighter-than-air ships, several hundred feet long, were intended for use in high-seas patrolling and scouting. They were capable of ranging all over the North Sea at altitudes that no airplane or antiaircraft gun of the time could reach, and they seemed to offer promise of great advantage to the German navy.

Moroccan and Balkan Crises

The formation (1904) of the Anglo-French Entente alarmed Germany, which in 1905 attempted to isolate France diplomatically by announcing its support of Moroccan independence. Contrary to German expectations, however, the British rallied to the support of the French, and the ALGECIRAS CONFERENCE (1906) approved the French plan of establishing a protectorate over Morocco. A second crisis concerning Morocco erupted in 1911, when a German gunboat, the Panther, entered the Moroccan port of Agadir, ostensibly to seek compensation for alleged violations of the Algeciras agreement. This action particularly alarmed the British, who responded with a strong warning. The French and Germans, however, negotiated an agreement by which Germany received minor compensation. Both MOROCCAN CRISES were successfully weathered, but they were symptomatic of the growing tension in European affairs and in turn contributed to that tension.

Another point of tension in Europe was the Balkans. During the early 1900s, Serbian economic dependence on Austria-Hungary began to wane, and relations between the two countries deteriorated. A crisis developed when Austria-Hungary annexed (1908) the former Turkish provinces of Bosnia and Hercegovina, largely inhabited by Serbian and other Slavic peoples. The annexation outraged Serbia and Montenegro, which had regarded the provinces as potential elements of a united Slav state in the Balkans. Russia backed Serbia, and Germany affirmed its support of Austria-Hungary, but armed hostilities were avoided. Nonetheless, the incident resulted in increased bitterness between Serbia and Austria-Hungary.

In 1912, Serbia, Bulgaria, Greece, and Montenegro formed the Balkan League for protection against their longtime common adversary—Ottoman Turkey. The first Balkan War (see BALKAN WARS) erupted shortly thereafter, during which the league successfully ousted the Turks from the Balkans. Fearing a spread of hostilities, the great powers intervened to terminate the war by the Treaty of London (May 30, 1913). Within a month, however, a

second war began, when Bulgaria opened surprise offensives against Serbia and Greece in the hope of occupying all of the contested districts of Macedonia that had been won from Turkey before the great powers intervened.

Romania and Turkey joined Greece and Serbia; Bulgaria was quickly defeated and overrun by her four neighbors. Under the Treaty of Bucharest (Aug. 10, 1913), Serbia and Greece were awarded possession of those parts of Macedonia they had claimed. Romania also received territory from Bulgaria, and under the Treaty of Constantinople (Sept. 29, 1913), Turkey recovered the greater part of the province of Adrianople from Bulgaria.

The two Balkan wars resulted in renewed antagonism between Bulgaria and the other Balkan states, especially Serbia. It also left all the Balkan states generally dissatisfied because of the interference of the great powers in Balkan politics.

OUTBREAK OF THE WAR

Assassination at Sarajevo

On June 28, 1914, the heir to the Austro-Hungarian throne, Archduke FRANZ FERDINAND, and his wife were murdered by a Serb terrorist in the Bosnian town of Sarajevo. Eager to expand in the Balkans and relying on German support, Austria accused the Serbian government of having instigated the assassination and delivered (July 23, 1914) an ultimatum demanding a virtual protectorate over Serbia. Serbia accepted all but one of the demands, but its response was unsatisfactory to Austria-Hungary. Refusing to submit the disputed terms to international arbitration, Austria-Hungary, on July 28, 1914, declared war on Serbia. The next day Austrian artillery bombarded Belgrade, the capital of Serbia.

Russia immediately ordered mobilization against Austria, whereupon, on August 1, Germany declared war against Russia. Russia's ally, France, then began to mobilize, prompting Germany to declare (August 3) war against France. Britain was not bound by the entente to enter the conflict (the entente powers did not form military alliances until after the outbreak of the war), but when the Germans began marching toward France through Belgium, the British government decided that it must honor its commitment to defend Belgian neutrality. It declared war on Germany on August 4. Within 2 days Austria-Hungary had declared war against Russia. Italy temporarily remained neutral, claiming that its obligations to the Triple Alliance were void because Austria had initiated the war.

The Opposing Strategies

The German war plan had been designed by Alfred, Graf von SCHLIEFFEN, chief of the German general staff (1891-1905). Anticipating a two-front war against France and Russia, Schlieffen envisioned holding the slower mobilizing Russians in check with a minimum of force while a massive German offensive crushed France, the more dangerous enemy.

Assuming that France would attempt to recover Alsace-Lorraine, Schlieffen schemed to entice the French into a major offensive there while 90 percent of the German army stormed through Belgium and the Netherlands, encircling the French and attacking them from the rear behind their weak left flank, ultimately driving them either into Switzerland or against the German fortified positions in Alsace-Lorraine. The principal German armies would then be transported to the eastern front by rail to crush the Russians.

If carried out as conceived, this plan might have ended the war within a few weeks. Schlieffen's successor, however, Gen. Helmuth von MOLTKE, faced different conditions in 1914 and was reluctant to violate Dutch neutrality; he decided to route the northernmost German troops through Belgium. Moltke also strengthened the forces defending both Alsace-Lorraine and Germany's eastern frontier, thus putting only 60 percent of German mobile field forces in the right-wing blow against France instead of Schlieffen's 90 percent.

The French Plan XVII called for an immediate attack through Alsace-Lorraine, as Schlieffen had anticipated. The French commander in chief, Gen. Joseph J. C. JOFFRE, was relying on the British Expeditionary Force (BEF) to reinforce the French left flank. He was also depending on the ability of the Russian army to launch simultaneous offensives against Germany and Austria in the east, disregarding the fact that Russian mobilization could not be completed for 3 months.

The initial Austrian war plans called for advances into Serbia and into Russian Poland, the vulnerable westernmost portion of the Russian Empire.

OPERATIONS IN 1914

Western Front

On August 4 a specially trained German task force of about 30,000 men crossed the Belgian frontier and attacked Liege, one of the strongest fortresses of Europe. Some of the fortifications were captured in a daring night attack led by Maj. Gen. Erich LUDENDORFF. The rest, pounded into submission by giant howitzers, surrendered on August 16. The German First Army under Gen. Alexander von Kluck and the Second, commanded by Gen. Karl von Bulow, poured through the Liege corridor and across the Meuse. Hastily mobilized Belgian field forces were brushed aside, and Brussels was occupied on August 20. The Belgians, personally commanded by King ALBERT I, retreated to Antwerp.

Farther east, the remaining German armies and the Anglo-French armies clashed in four almost simultaneous encounters called the Battles of the Frontiers. On August 8, French troops under Gen. Paul Pau advanced across the frontier to Mulhouse in Alsace. After 6 days a full-scale French offensive called the Battle of Lorraine began southeast of Metz. Following planned withdrawals, the Germans counterattacked, throwing the French back to the fortified heights of Nancy, where they barely managed to halt the German drive. Farther west, on August 20, advancing French troops collided with a numerically superior German force in the Battle of the Ardennes. After 4 days of furious fighting, the devastated French fell back to reorganize west of the Meuse.

With German armies sweeping west and southwest through Belgium toward northern France, Joffre ordered troops under Gen. Charles Lanrezac into the Sambre-Meuse angle. In the Battle of the Sambre (August 22-23) two German armies struck Lanrezac southwest of Namur, on the Sambre River, forcing him to retreat. The Belgian defenders of Namur were overwhelmed (August 23) by Bulow's troops after a brief siege.

The newly landed BEF under Field Marshal Sir John FRENCH had moved (August 21) into Belgium to support Lanrezac's advance. Near Mons the BEF was struck (August 23) by the full weight of Kluck's German First Army. Learning of the fall of Namur, Lanrezac ordered a general retreat, leaving the outnumbered British with an unprotected left flank and forcing them to withdraw during the night.

The French offensive had failed completely. Moltke, however, hampered by poor communications with his armies, overestimated the extent of the initial German victory. Confident that the French armies were on the brink of destruction, he detached two corps from Kluck's army to the eastern front, where the Russians were threatening East Prussia. German troops were also dispatched to contain the Belgian army at Antwerp and to besiege the French fortress of Maubeuge, reducing the three German right-wing armies from a total strength of 16 corps to 11. The already watered-down Schlieffen Plan—dependent on a right-wing hammer blow—was thus further weakened.

Joffre, who was maintaining close contact with his field commanders, anticipated the German battle plan and mapped a counterattack. Ordering his First and Second Armies to hold Verdun and the Nancy heights at all costs, Joffre created the Sixth Army, under Gen. Michel J. Maunoury, which assembled first near Amiens, later in and around Paris, and prepared to attack east.

At Le Cateau on August 27, French's BEF fought off a double envelopment by the full strength of Kluck's army; the survivors successfully disengaged at nightfall. To relieve German pressure on the British at Le Cateau, Joffre ordered the French Fifth Army, itself pressed hard by the German Second Army, to make a 90-degree shift westward to attack the left flank of the German First Army at Guise. The initial attack on August 29 was inconsequential, but Gen. Louis Franchet d'Esperey, commanding Lanrezac's I Corps, halted the German advance, achieving the first French tactical success in the campaign. Bulow called on Kluck for aid the next day.

General von Kluck assumed that his victories at Mons and Le Cateau had driven the British out of the picture. Believing the French Fifth Army to be the left-flank unit of the opposing field forces, Kluck responded to Bulow's call for assistance by shifting his direction of march to the southeast, thus discarding the remnants of the Schlieffen Plan. This change would cause him to pass east of Paris; he knew nothing of General Maunoury's concentration in the fortified area of the capital. Belatedly, Moltke sent a message to Kluck, agreeing to the move east of Paris but ordering Kluck to guard the right flank of the Second Army. For Kluck to have obeyed the order would have meant halting his army for 2 days, a move he believed would permit the French either to escape or to rally. Intent on driving the French out of Paris, Kluck continued southward across the Marne, just east of Paris, his right flank wide open.

On September 4, Joffre set in motion a plan to envelop the exposed German right flank on September 6.

Meanwhile, Maunoury's Sixth Army, temporarily under the regional command of Gen. Joseph S. GALLIENI, the military governor of Paris, had begun an advance from Paris toward the Ourcq River, where Kluck's right flank lay invitingly open. The First Battle of the Marne (see MARNE, BATTLES OF THE) was joined on September 5, and after 2 days of furious fighting Kluck turned his entire army westward in savage counterattacks that halted the French and forced Maunoury to fall back on the defensive (September 7-9). Only the arrival of reinforcements rushed from Paris by Gallieni—some in commandeered taxicabs—permitted Maunoury to stem the German advance.

By this time the action had become general along the entire front west of Verdun. Assuming that the BEF was no longer a threat, Kluck shifted westward, widening an already existing gap between his army and that of Bulow, which was still advancing south. Exploiting the gap, the French commander Franchet d'Esperey, in a vigorous night attack, wrested Marchais-en-Brie from the Germans. This outcome was probably the turning point of the battle. Bulow—personally defeated—was about to retreat. Kluck's First Army was making headway in the northwest against Maunoury's left, but the BEF's northward advance into the gap threatened Kluck's left and rear. Realizing that his offensive had failed, Moltke ordered a retreat to the Noyon-Verdun line. On September 14, Moltke was relieved; Gen. Erich von FALKENHAYN replaced him.

The German strategy failed because of Moltke's modifications to the Schlieffen Plan and inefficiency. After emasculating the plan, he subsequently lost all personal touch with his army commanders and their progress. Joffre, on the other hand, emerged as a decisive and capable leader whose bold counterattack was masterfully executed by the resilient French army. The BEF, a small but efficient professional army, played a role out of proportion to its size.

Casualties on both sides were enormous—the Allies lost about 250,000 men; German losses were somewhat greater. During 3 weeks of war, each side had suffered more than half a million men killed, wounded, or captured.

The First Battle of the Marne, tactically inconclusive, was a clear-cut strategic victory for the Allies as Joffre emerged as the savior of France. Moreover, the encounter ended the possibility of Germany's winning the war quickly. The Allied nations had far superior resources, and a long war gave them a definite advantage over the Central Powers.

Both sides now extended their operations northward, each attempting to outflank the other in a series of maneuvers that has been called "the race to the sea." Maubeuge, on France's northern border, fell to the Germans on September 8, as did the Belgian fortress of Antwerp on October 9. Fierce battles in Picardy (September 22-26) and Artois (September 27-October 10) were followed in late October and November by the Battle of the Yser and the bloody First Battle of Ypres (see YPRES, BATTLES OF). At Ypres, the BEF was nearly demolished while successfully repelling a German drive. Shortly thereafter the era of stabilized trench warfare began, as mass conscript armies used the spade, machine gun, and barbed wire to deny maneuver between the North Sea and the Swiss border. By this time operations on the western front had resulted in nearly 1 million Allied casualties; German losses were almost as great.

Eastern Front

Short of materiel and with mobilization only one-third complete, the Russians nevertheless began their offensive in mid-August in response to French requests. On August 17 the Russian Northwest Army Group began to advance into East Prussia. From the east came Gen. Pavel K. Rennenkampf's First Army; from the south Aleksandr Samsonov's Second Army. Opposing them was German Gen. Max von Prittwitz and Gaffron's Eighth Army, its mission one of elastic defense and delay until the bulk of the German army could be shifted from the western front.

The center of Rennenkampf's widely strung advance was badly mauled (August 17) by Gen. Hermann K. von Francois's German I Corps near Stalluponen. Subsequently, 3 days later at Gumbinnen, two-thirds of Prittwitz's forces were repulsed by Rennenkampf, who had attacked from the east. Prittwitz, fearing envelopment by Samsonov's army, decided to withdraw to the Vistula River, thus ceding all of East Prussia. He telephoned Moltke at Coblenz, reporting his decision and requesting reinforcements to hold the Vistula line. Moltke at once relieved Prittwitz of command, appointing in his place the 67-year-old Gen. Paul von HINDENBURG, who had retired in 1911; Gen. Erich Ludendorff, the brilliant hero of Liege, was named Hindenburg's chief of staff.

The revamped German battle plan, developed on August 21—2 days before Hindenburg and Ludendorff assumed command—called for the deployment of one lone cavalry division to delay Rennenkampf, while the bulk of the German army was shifted south, by rail and road, to confront Samsonov.

and MELLIAD. O general goal is to improve the design of national programs, which should emphasize the importance of quality high school students, having good O and courses that are aligned with standards in mathematics, science, English, and social studies. The CHARTER should also provide for aligned math and English standards.

The project will also support the expansion of the new high school students and their families to expand their educational choices to include both public and private schools, and the creation of specialized schools—such as vocational schools or online schools—that meet modern standards.

As one of the first and most prominent goals is to move from a culture of compliance to one of innovation and creativity, which will help to build trust among our members and partners across the country, because we believe that it is important to align education with the needs of our students and our communities. This will involve working closely with our members and partners to identify and prioritize areas of focus, such as STEM and math education, and how they can best support them. We will also work to develop a culture of innovation, creativity, and risk-taking, which will help to build trust among our members and partners, and to ensure that our members and partners feel supported and encouraged to take risks and try new things.

The project will also include a pilot program to enhance health systems reform and to support local governments in the implementation of a new financing structure to help the public sector provide better services to citizens, particularly those in rural areas. This will involve working closely with local governments to develop a financing structure that supports local health systems and to encourage the public sector to invest in health systems reform.

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Advancing without reconnaissance or cavalry screen, Samsonov's troops encountered entrenched Germans near Frankenau on August 24. Severe fighting raged the entire day between Frankenau and Tannenberg (see TANNENBERG, BATTLES OF). While other units of the Eighth Army rushed to join the battle, the Germans intercepted Samsonov's uncoded radio messages and learned the locations of all Russian units.

On August 26 the Germans counterattacked from north, east, and west. By nightfall of August 29, General von Francois stretched his I Corps across the entire Russian rear and the encirclement was complete. Samsonov, who disappeared the night of August 29, evidently committed suicide. Only one-third of the Russian Second Army escaped the German net; 125,000 Russians were killed, wounded, or taken prisoner, compared to German losses of 10,000 to 14,000 men.

Turning northeastward, the German Eighth Army promptly moved against the Russian First Army in the First Battle of the Masurian Lakes (September 9-14). Again, Francois and his I Corps excelled. Rennenkampf, almost surrounded, finally disengaged under cover of a stout two-division counterattack.

Aside from its strategic significance, the German double victory was a tremendous psychological coup. Russian troops had been expelled from East Prussia, the Russian army had been dealt a devastating blow, and Allied confidence in Russia was shattered. Nonetheless, the heavy fighting in the east had eased German pressure on the western powers, and in the afterglow of Tannenberg and Masurian Lakes enthusiastic Germans overlooked the true significance of the Battle of the Marne, which ended on September 10.

Austrian Invasions of Serbia

On August 12, Austrian troops numbering 200,000, commanded by Gen. Oskar Potiorek, crossed the Sava and Drina rivers to invade Serbia. They were driven back (August 16) by the numerically superior Serbian army, inadequately equipped but battlewise from their Balkan Wars experience, commanded by the able Marshal Radomir Putnik. Putnik, victorious at Cer Mountain (August 15-20) and Sabac (August 21-24), assaulted the Austrian bridgeheads in the Battle of Drina on September 8. After 10 days of vicious, bitter fighting, and experiencing a shortage of ammunition, Putnik withdrew to more defensible positions southwest of Belgrade.

The third Austrian offensive began on November 5. A reinforced Austrian army succeeded in occupying Belgrade on December 2, but Putnik's troops—having received desperately needed ammunition from France—counterattacked the next day, driving the invaders from Serbian terrain and recapturing Belgrade on December 15. Austrian casualties in this savagely fought campaign were approximately 227,000 out of 450,000 engaged. Serbian losses were approximately 170,000 out of 400,000.

Operations in Poland

Humiliated in East Prussia, the Russian army was more successful farther south. In the Galician Battles (August 23-September 11), Russian forces under Gen. Nikolai Ivanov repelled an Austrian offensive, seizing all of Austrian Galicia except for the key fortress of Przemysl.

Following this debacle, Hindenburg moved to assist the defeated Austrians in Galicia and prevent a Russian invasion of Silesia. With extraordinary efficiency, four German corps of the Eighth Army were transferred by rail to the vicinity of Krakow, becoming the German Ninth Army, commanded directly by Hindenburg. On September 28 a general Austro-German advance began.

Meanwhile, as the Germans expected, Grand Duke Nikolai, the Russian supreme commander, was preparing for a general offensive through Poland into Silesia, the heart of Germany's mineral resources. Before the Russians could move, however, their left flank was hit (September 30) by the German Ninth Army. By October 9 the Germans reached the Vistula River south of Warsaw, but, outnumbered more than three to one, they halted their offensive on October 12.

Hindenburg withdrew skillfully 5 days later, leaving a ravaged countryside behind him. By the end of October the Austro-German armies had fallen back to their original line but had seriously delayed the projected Russian offensive.

On November 1, Hindenburg was appointed commander in chief of the Austro-German eastern front, with Ludendorff still his chief of staff. He was informed that he could expect no reinforcements although the Russians

had renewed their advance. The German Ninth Army, now commanded by Gen. August von Mackensen, was smoothly shifted northwest to the Posen-Thorn area, again leaving a wide gap of ravaged territory in front of the vast Russian concentration southwest of Warsaw.

The German Ninth Army opened the Battle of Lodz (November 11-25), striking southeast between the First and Second Russian armies, which were protecting the northern flank of the grand duke's planned offensive. The Russian First Army (still under Rennenkampf) was crushed and the new Second, near Lodz, was embraced by a German pincer. The key element of the German stroke was the XXV Reserve Corps, commanded by Gen. Reinhard von Scheffer-Boyadel. It rolled through the gap between the Russian armies and turned south and then west before the Russian Fifth Army from the south and an improvised group from the northern forces checked Scheffer's advance. Completely surrounded, Scheffer, in an amazing display of leadership, not only broke through to safety but also brought back with him 16,000 prisoners, 65 captured guns, and his own wounded men. The Battle of Lodz was tactically a Russian victory because the Russians checked the German advance. Nevertheless, it was a strategic success for the Germans: Lodz was evacuated, and the Russians—their offensive called off—fell back in a general retirement, no longer a threat to Germany. German losses were about 35,000 killed and wounded. Russian losses are not known; a conservative estimate would be 90,000. The year ended in a stalemate on the eastern front.

The War at Sea

The Germans hoped to equalize the struggle for control of the seas by employing a kind of maritime guerrilla warfare—land mines and submarine attacks—to chip away at the numerically superior British fleet.

At the war's beginnings the British Grand Fleet, poised in its bases at Scapa Flow and Rosyth, kept the German High Seas Fleet bottled up behind the highly fortified Heligoland-Jade littoral in the North Sea. Neutral Denmark locked the Baltic gateway to both contestants by mining the Skagerrak. On August 28 a British raid into the Heligoland Bight resulted in the war's first naval battle, in which four German vessels were sunk. In late August the fast German light cruiser Emden, under Capt. Karl von Muller, sailed from the China Sea into the Indian Ocean where it harassed British shipping, taking 21 prizes and destroying ships and cargo valued at more than \$10 million. On September 22 the Emden bombarded Madras, India. The end of its gallant cruise came on November 9 when it was sunk in a hard-fought action with the Australian cruiser Sydney at the Cocos Islands.

Submarine warfare erupted on September 22, when the German submarine U-9, off the Dutch coast, sank three British cruisers in quick succession. A U-boat raid on Scapa Flow on October 18, although unsuccessful, resulted in the temporary transfer of the British Grand Fleet to Rosyth on the Scottish coast while antisubmarine nets were installed at Scapa. The cruiser HMS Hawk was torpedoed and sunk on October 15. The battleship Audacious struck a German mine, laid by a submarine off the Irish coast, and sank on October 27. The French battleship Jean Bart was torpedoed on December 25 by an Austrian submarine in the Straits of Otranto.

Meanwhile, British Vice Adm. Sir Christopher Cradock, with two elderly heavy cruisers and one light cruiser, plus a converted merchant-ship auxiliary cruiser, pursued Adm. Graf von Spee's China Squadron—two heavy and three light cruisers—to the coast of Chile. The rival naval forces met in the Battle of Coronel on November 1.

On paper the fire power of the two forces was about equal, but Cradock possessed fewer large-caliber guns than the Germans. In a stunning upset, Spee sank the two British heavy cruisers without losing a single ship. Shocked by the Coronel disaster, the British Admiralty rushed the battle cruisers Invincible and Inflexible, under Vice Adm. Sir Frederick Sturdee, to seek Spee, who had taken his squadron around Cape Horn into the South Atlantic. He planned to raid the British wireless and coaling station at Port Stanley, Falkland Islands, but discovered Sturdee's squadron there, refueling. The surprised Germans fled but were pursued and destroyed; approximately 1,800 Germans—including Spee—perished on the sunken ships. The German light cruiser Dresden, which escaped the Falkland Islands debacle, was sunk off the Juan Fernandez Islands on Mar. 14, 1915.

By the end of 1914, except for the High Seas Fleet in the Jade and the Baltic command based on Kiel, the German flag had been practically swept from the seas. Allied maritime traffic was uninterrupted, while Germany, feeling the pinch of naval blockade, focused its attention on the one major weapon left to it on the high seas: the submarine.

Other Operations

Six small British overseas expeditions—four from England and two from Australia and New Zealand—moved in August against German colonies. Togoland, southwest Africa, Samoa, and some of the German Pacific islands

were taken in late 1914 or early 1915. The Cameroons fell in 1916.

Japan, entering the war on the Allied side on August 23, besieged Tsingtao, the only German base on the China coast, capturing it on November 7. Japan also occupied Germany's Marshall, Marianas, Palau, and Caroline Island groups.

On Oct. 29, 1914, Turkey, encouraged by the Germans, declared war against the Allies, announcing its entrance into the war with a surprise bombardment of the Russian Black Sea coast. Great Britain responded to the Turkish threat by annexing (November 5) Turkish Cyprus. On December 17, Britain declared a protectorate over Egypt—nominally a state subject to Turkey—and began moving troops there to defend the Suez Canal.

OPERATIONS IN 1915

Global Strategy

Turkey's alignment with the Central Powers had closed the Dardanelles to the Allies, thus physically separating Russia from Britain and France. Russia, shaken by the reverses of 1914, was now almost completely cut off from vitally needed Franco-British war supplies. The western Allies, at the same time, were anxious to regain access to the Ukrainian grain fields. This situation led to a strategic debate in Britain: Winston Churchill, first lord of the Admiralty, urged immediate seizure of the Dardanelles to restore the vital Mediterranean-Black Sea supply route to Russia; the British war minister, Herbert Horatio, Lord KITCHENER, was equally insistent that a decision be obtained on the stalemated western front. Kitchener—and the French leadership—opposed reduction of strength in the west for a peripheral operation in the east. Nevertheless, in early January, the British War Council approved an expedition against the Dardanelles.

In the camp of the Central Powers, strategical opinion was also divided. The Hindenburg-Ludendorff team urged an all-out effort against the faltering Russians. Falkenhayn, reconciled to a war of attrition, believed that it would have to be won in the west. He maintained that tactical victories in the east would be meaningless because of Russia's vast territorial and manpower resources. Austrian-Hungarian reverses in Galicia, however, led the emperor and Falkenhayn to provide German troops to assist their ally. Accordingly, the Germans adopted a defensive posture in the west, while seeking a decision against Russia.

Western Front

At the beginning of the year the Allies continued futile offensives in Artois and Champagne. The British failed at Neuve Chapelle on March 10, after nearly achieving a breakthrough. French casualties approached 400,000 during this period; British and German losses were also heavy.

On the night of January 19-20 bombing attacks on Britain by Zeppelin dirigible airships under the control of the German navy resulted in few casualties, causing more anger than panic. During that year 18 more such raids occurred. The largest killed 59 people in London on October 13.

On April 22, Allied preparations for another coordinated offensive at Ypres were spoiled by a surprise German attack preceded by a cloud of chlorine gas emitted from about 5,000 cylinders. This was the first use of poison gas in the west. Two German corps drove through two terrorized French divisions and bit deeply into British lines, creating a wide gap. The Germans, however, had no reserves available, most of their troops having been diverted to the eastern front. Local counterattacks by the British Second Army finally stemmed the German advance after bitter fighting.

In May and June the Allies renewed their offensives in the north, but were repulsed in the Second Battle of Artois. Exhausted by their costly and unsuccessful assaults during the first half of the year, the Allies spent the rest of the summer resting, reorganizing, and reinforcing, as did the Germans. Both sides had come perilously close to expending their ammunition reserves and were now waiting for munitions production to catch up with consumption.

In September and October the Allies again launched unsuccessful offensives: the Second Battle of Champagne and the Third Battle of Artois. The minor gains made were out of proportion to the casualties suffered: more than 200,000 French, nearly 100,000 British, and 140,000 Germans. Blamed for the failure at Loos in the Third Battle of Artois, French was replaced by Sir Douglas HAIG in command of the BEF.

Increase of lethal firepower, both machine gun and field artillery, had revolutionized combat tactics. The advantage

was now with the defense, which was able to bring up reserves to limit a penetration before the attackers could move forward sufficient reserves and artillery to exploit a breakthrough. The continuous battle line on the western front prevented classical offensive maneuvers. The Germans, recognizing this change long before the Allies, had adopted an elastic defense, in two or more widely separate lines, highly organized with entrenchments and barbed wire, heavy in machine guns, and supported by artillery. Assaulting troops broke through the first line only to be almost demolished by the fire from the succeeding lines and pounded by artillery beyond the range of their own guns.

Appalling losses were suffered during 1915 on both sides: 612,000 Germans, 1,292,000 French, and 279,000 British. The year ended with no appreciable shift in the hostile battle lines scarring the land from the North Sea to the Swiss Alps.

The Italian Front

Baited by shrewd Allied diplomacy offering vast territorial gains, Italy declared war on Austria on May 23. The Italian army, commanded by Gen. Luigi Cadorna, was about 875,000 strong, but it was deficient in artillery, transport, and ammunition reserves. The Italian plan intended to hold the Trentino salient into Italy by offensive-defense action, while taking the offense eastward in the Isonzo salient projecting into Austrian territory. The immediate objective was Gorizia, but Italian military men envisioned advancing through Trieste to Vienna.

Austria had heavily fortified its mountainous Italian border. Austrian archduke Eugene was in overall command of the Italian front. Gen. Svetozar Borojevic von Bojna, with approximately 100,000 men, held the critical Isonzo sector.

On June 23 two Italian armies, each about 100,000 strong, attacked toward Gorizia in the First Battle of the Isonzo. They battered in vain against the Austrian defenses. Cadorna, bringing up more artillery, tried again on July 18, retreating on August 3 when artillery ammunition gave out.

On October 18 the Italians—reorganized, strengthened, and supported by 1,200 guns—struck once more at Gorizia and were again repulsed in the Third Battle of the Isonzo. After a lull of 6 days, the Italians tried again on November 10. When the offensive broke off on December 2, no material gain had been made, despite huge Italian losses. As in France, the invulnerability of highly organized positions to frontal assault had been proved. The Austrian defense was skillful; the Italian offensive tactics were inefficient, despite much gallantry.

The Eastern Front

The Central Powers, reinforcing their armies in the east, launched a great offensive under Hindenburg on January 31 with the Battle of Bolimov, a feint by the German Ninth Army aimed at Warsaw, designed to distract Russian attention. Poison gas shells were used for the first time, but they were not highly effective in the freezing temperatures, and the Russians did not report the gas attack.

On February 7, farther north, the German Eighth Army, in a blinding snowstorm, struck the left flank of the Russian Tenth Army. The next day the new German Tenth Army to the north hit the Russian right. The Russians were rapidly driven back into the Augustow Forest, barely escaping encirclement by the end of the month. About 90,000 prisoners were taken in this Winter Battle, or Second Battle of the Masurian Lakes. The newly formed Russian Twelfth Army counterattacked Hindenburg's right on February 22, halting German progress after an advance of 113 km (70 mi).

Meanwhile, following initial Austrian successes, further progress into Galicia was halted by a Russian counterattack, and after a siege of 194 days, Przemysl and its garrison of 110,000 men surrendered (March 22) to the Russians.

Still determined to defeat Russia decisively, the emperor ordered Falkenhayn to give full priority to the eastern front. Sending reinforcements, Falkenhayn came east to assume direct overall command. While Hindenburg's army group kept the Russians occupied north of Warsaw, the new German Eleventh Army, under Gen. August von Mackensen, supported by Austrian units, was to make the main effort farther south between Tarnow and Gorlice.

Concentrating superior force for the main effort, on May 2 the Austro-German armies crashed through the Russian Third Army on a 48-km (28-mi) front. The southern face of the great Russian Polish-Galician salient began to crumble. Przemysl was retaken on June 3, Lemberg occupied on June 22, and the next day German troops crossed the Dnestr River.

Thrusting into northern Poland, Gen. Max von Gallwitz's new German Twelfth Army advanced toward Warsaw, which fell on August 5. The entire Russian front was in complete collapse. On August 25, Brest-Litovsk fell, and Grodno a week later. The German occupation of Vilna on September 18 climaxed the colossal advance of 480 km (300 mi). Skillfully, Grand Duke Nikolai had kept his armies intact, and they withdrew in fairly good order, evading German attempts at envelopment. Autumn rains eventually turned roads into quagmires, and the reeling Russians were able to halt the German advance. By the year's end the eastern front was a line running north and south from Riga on the Baltic to the eastern end of the Carpathians.

Unlike the trench-dominated western front, vast expanses and limited troop strength allowed a war of movement on a grand scale, part of it in mountainous terrain, all of it hampered by primitive road conditions. German operations had been both methodical and brilliant. Austrian operations were spotty, due partly to lower professional standards and partly to friction resulting from Austrian resentment of German arrogance. On the Russian side, poor troop leadership and lack of weapons and supplies were jointly responsible for defeat. Russian casualties on this front in 1915 were more than 2 million men, of whom about half had been captured. Combined German and Austrian casualties were in excess of 1 million.

The Balkan Front

Direct communication between Turkey and its allies was essential to the Central Powers if the Turkish Straits were to be held and Russia kept isolated from the Western Allies. The railway line passing through Serbia had been closed since the beginning of the war; munitions from Germany to Turkey passed through neutral Romania until June, when Romania closed the channel. Meanwhile, Bulgaria saw an opportunity to gain revenge for the Second Balkan War by threatening Greece, which was prepared to aid Serbia. Greece requested Allied aid, and on October 9 a small Franco-British force disembarked at Salonika. On the same day, however, a political upheaval in Greece completely altered the situation; the pro-German king, CONSTANTINE I, dismissed his pro-Allied prime minister, Eleutherios VENIZELOS, and announced he would maintain Greek neutrality.

Meanwhile, on October 6, two armies—one Austrian and one German—drove south across the Serbian Sava-Danube border. Two Bulgarian armies struck west on October 11; one on Nis, the other on Skopje. Half-hearted Allied efforts to assist Serbia by advance from Salonika were turned back by superior Bulgarian forces. After a dismal retreat through the snow-covered mountains, the remnants of the Serbian army, accompanied by a horde of civilian refugees, reached the Adriatic in late November, pursued by the Austrians.

The Dardanelles and Gallipoli

In January the British began planning for a major operation to knock Turkey out of the war and to reopen communications between the Western Allies (Britain and France) and Russia. Winston Churchill directed an Allied fleet—mostly British—to force the Dardanelles, then steam to Constantinople to dictate peace terms.

The operation began on February 19, when a Franco-British fleet under British Vice Adm. Sackville Carden attempted systematic reduction of formidable fortifications lining both sides of the narrow Straits. By February 25 the outer Turkish forts were silenced, and Allied vessels could enter the straits. The principal fortifications at the Narrows were attacked on March 18, under the command of Rear Adm. John de Robeck, who took command after Carden became ill. Success seemed imminent as Turkish guns fell silent, but in a startling reversal of fate, three British battleships were struck by mines. Unaware that the Turks were at the end of their resources and almost devoid of ammunition, de Robeck withdrew.

Meanwhile, a hastily gathered British expeditionary force of 78,000 men (including one French division) was en route from England and Egypt for the purpose of capturing the Gallipoli Peninsula on the western shore of the Dardanelles (see GALLIPOLI CAMPAIGN). German Gen. Otto Liman von Sanders, in command of approximately 60,000 Turkish troops, was fully aware of the impending invasion and positioned his men accordingly.

On April 25 the British, under Gen. Ian Hamilton, conducted several amphibious landings near the tip of the Gallipoli Peninsula. Although the troops came ashore, they were soon pinned down in several unconnected beachheads, stopped by a combination of stubborn Turkish defense and Hamilton's inability to coordinate and direct the scattered landings. The Turks ringed the tiny beachheads with entrenchments, and the British found themselves in trench warfare like that on the western front, but with even less room for maneuver.

On August 6, after the arrival of reinforcements, Hamilton attempted new landings, but because of fear of German

to determine if new a heretic religion could affect our strategy for peace between Islam and Christianity.
After much research, we found that the most effective way to do this was to have a large base of
Christian leaders from around the world, all working together to spread the message of love and
peace. This would allow us to reach a wide audience and make a real impact on the world.

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Other effects include self-reinforcement, lack of influence over results of their actions, and the need for others' opinions before action can be taken. These must be addressed if the teacher is to help students develop a growth mind-set and become effective learners.

studied with regard to their ability to bind proteins and nucleic acids. The results show that the binding of proteins to the DNA is dependent on the presence of specific amino acid residues, particularly tyrosine, phenylalanine, and tryptophan.

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It made it clear that we will have to use training methods of learning systems to automatically detect disease and predict risk factors to better identify patients who need treatment from a medical professional.

Debido a que el sistema de control es un sistema de retroalimentación, la respuesta a una señal de control es dependiente de la señal de retroalimentación. La retroalimentación es una señal que se obtiene de la respuesta del sistema y se usa para ajustar la señal de control.

do apreindere facilmente quando se luta por um ideal que é de todos os homens.

efficacy of the drug against experimental tumors in both mice and rats, in which the drug was administered once a week over four weeks starting just prior to injection of the tumor cells and continuing up to the time of tumor measurement. The results of these experiments are summarized in Table I. It can be seen that the tumor cells were suppressed significantly after treatment with the drug.

¹ See also the discussion of the relationship between the two in the section on the "Economic Crisis and the Decline of the Soviet Union."

submarines, no battleships were available to provide artillery support. The second assault fared no better than the first. The operation had failed. Russia was permanently cut off from its allies. Hamilton was relieved on October 15 by Gen. Sir Charles Monro, who directed a masterful evacuation, completed on Jan. 8-9, 1916. Allied casualties for the Dardanelles campaign amounted to 252,000. The Turks lost 251,000.

With the possible exception of the Crimean War, the Gallipoli expedition was the most poorly mounted and ineptly controlled operation in modern British military history. On the Turkish side Liman von Sanders conducted a brilliant, active defense. Mustafa Kemal (see ATATURK, KEMAL), his chief subordinate, who later became one of the founders of modern Turkey, shone as an aggressive division commander.

The Caucasus and Persian Fronts

In the Caucasus, the area between Russia and Turkey, 1915 began with the Battle of Sarikamis. The Russians, near Kars with about 100,000 men, opposed a slightly smaller Turkish army. The Turks' dream of a wide envelopment of the Russians was spoiled by a Russian counterattack that smashed their army on January 3. The Turks incurred 30,000 dead, while thousands more froze to death in retreat. On September 24, Grand Duke Nikolai, unceremoniously relieved of command in Poland by the tsar, arrived to take command in the Caucasus. With Gen. Nikolai Yudenich, Nikolai mapped plans for a large-scale offensive.

Persia's declaration of neutrality was virtually ignored by the belligerents in the Middle East. Russia occupied most of northern Persia. When Turkey entered the war, the British occupied the northwestern Persian Gulf to protect their oil interests and to secure a base for operations in Mesopotamia. The Turks seized most of Persian Kurdistan in the northwest.

Egypt and Mesopotamia

Early in the year the Allies were shaken by Turkish commander Djemal Pasha's attempt to seize the Suez Canal. On January 14, Djemal set out secretly across the Sinai Peninsula from Beersheba with a force of 22,000 men. Advance elements of the force struck across the canal in German-type pontoon boats on February 2, but the attackers were repelled. No further Turkish assault was made against the canal, but the threat held back much-needed British reinforcements from Gallipoli.

In Mesopotamia the British occupied Basra, ostensibly to protect the oil wells at the head of the Persian Gulf. This motive became obscured, however, when, lured by the prospect of capturing the legendary Baghdad, the British commander Gen. Sir John E. Nixon sent forces under Maj. Gen. Charles Townshend up the Tigris. After overwhelming a Turkish outpost near Qurna in an amphibious assault on May 31, Townshend began to move inland. By September the British had taken Kut-el-Amara. Refusing to stop there, Nixon ordered the reluctant Townshend to continue northward.

Arriving (November) at Ctesiphon, Townshend discovered that the Turks had fortified extensively and had been reinforced to a strength of 18,000 regulars and additional Arabs, with 45 guns. Townshend mustered approximately 10,000 infantry, 1,000 cavalry, and 30 guns. He also had, for the first time in that theater, a squadron of 7 airplanes. Townshend attacked Ctesiphon savagely on November 22, but after 4 days of bitter battle, during which more Turkish reinforcements arrived, Townshend withdrew to Kut. Kut was invested by the Turks on December 7.

The War at Sea

On January 23 the German battle cruiser squadron under Vice Adm. Franz von Hipper moved out to raid the English coast and harass the British fishing fleet. Warned by radio intercepts, the Grand Fleet steamed to meet an expected full-dress attack. On January 24, British Adm. David Beatty's battle cruiser squadron fell in with Hipper off the Dogger Bank. Hipper wisely fled, but Beatty, with superior speed, overhauled him. In the ensuing battle, the Germans lost one cruiser and both flagships were damaged. Through misunderstanding of signals, the British pursuit was not vigorous, and Hipper's remaining ships got away.

Submarine warfare intensified on February 4 when Germany initiated a campaign against Allied merchantmen in waters surrounding the British Isles. Neutrals were also attacked; a Norwegian ship was sunk (February 19) and—despite U.S. warnings to Germany—on May 1 the American tanker Gulflight was torpedoed, causing three deaths.

On May 7 the British luxury liner LUSITANIA was torpedoed without warning by a U-boat off the Irish coast. Among

the 1,198 lost were 124 Americans. Feeling in the United States ran high, despite the facts that the liner carried a war cargo, including gold and ammunition; was under orders not to halt if hailed; and, before its departure from New York, the German embassy in Washington had publicly warned Americans not to travel on the ship.

On August 19 the British liner Arabic was sunk, with the loss of four more Americans. Reaction in the United States became so hostile that on September 1 Germany announced cessation of unlimited submarine warfare. By year's end, however, German U-boats had destroyed almost 1 million tons of Allied shipping.

OPERATIONS IN 1916

Global Strategy

The year opened with the Central Powers and the Allies at approximately equal strength. The manpower drain in France was serious. Britain was on the verge of instituting compulsory military service to fill its expanding armies. Unrest in Ireland was approaching rebellion. Russia, with more than sufficient manpower, hoped for time to reorganize and supply it. Germany now sought a decision on the western front because, as Falkenhayn told the emperor, France would be "bled white" in attempting to prevent a German victory. In an Allied conference at Chantilly in December 1915, Joffre succeeded in obtaining agreement from Britain, Russia, Italy, and Romania that coordinated offensives would be launched on the western, eastern, and Italian fronts, probably about June, when Russia would be ready.

The Western Front

Both Joffre and Falkenhayn planned great offensives to break the deadlock in the west. But the Germans struck first. Following an enormous bombardment on February 21, the crown prince's German Fifth Army attacked the fortified but lightly garrisoned region of Verdun, lying in the middle of a salient jutting into the German zone (see VERDUN, BATTLE OF). The first German assault, on a 13-km (8-mi) front east of Verdun, gained considerable territory and captured a key position, Fort Douaumont. Joffre, however, intent to hold Verdun as a symbol of French determination and to retain an anchor for his battle lines, prohibited further retreat. He sent Gen. Henri Philippe PETAIN with reinforcements to defend the region.

The next German attack, launched (March 6) against the western face of the salient, was eventually checked by French counterattacks. For the rest of the month attacks and counterattacks heaped the ground with corpses. The watchword for the defense became France's motto for the remainder of the war: Ils ne passeront pas! ("They shall not pass!") The third German offensive, which struck both sides of the salient on April 9, was checked by May 19. Renewed German assaults on the western salient face in late June and early July almost broke the French line, but the French clung to their positions, and the Germans hesitated. Pressing demands for replacements on the eastern front then drained 15 German divisions from Verdun. Falkenhayn was relieved of command on August 19, and the Hindenburg-Ludendorff team, replacing him, decided to follow defensive tactics in the west.

In October and November the French—now under Gen. Robert NIVELLE—proceeded to the offensive, retaking Forts Douaumont and Vaux. By December 18 the French front had almost reached the lines held in February, bringing the campaign to a close. The casualties in this bitterly fought battle were approximately 542,000 French and 434,000 German.

The year-long crisis at Verdun forced postponement of Joffre's long-planned Allied offensive. Finally, on June 24, the attack was launched by a week-long artillery bombardment. The main effort was to be made by British Gen. Henry S. Rawlinson's Fourth Army north of the Somme, with Gen. Edmund ALLENBY's Third Army farther north also attacking. South of the river the French Army Group of the North would make a holding attack (see SOMME, BATTLES OF THE).

On July 1 the British infantry, following an artillery barrage, were mowed down by German machine guns. By nightfall the British had lost about 60,000 men, 19,000 of them dead—the greatest 1-day loss in the history of the British army. The French, surprisingly, made greater advances, since the Germans had not expected them to participate in the initial assault and consequently were surprised by the attacks south of the Somme. Despite the appalling losses of the first day, the British continued to forge ahead in a series of small, limited attacks. Falkenhayn, determined to check the threat, began shifting reinforcements from the Verdun front. To this extent, one objective of the offensive had been accomplished.

The second German line was cracked on July 13, but little advantage was gained. Haig, commander of the BEF,

launched another major offensive on September 15, southwest of Bapaume. British tanks—never before used in battle—had been secretly shipped to the front, and spearheaded the attack. Despite the surprise their appearance caused to the Germans, the tanks were underpowered, unreliable, too slow, and too few in number to gain a decisive victory (out of 47 brought up, only 9 completed their tasks in the battle). As at Verdun, casualty figures were horrendous: British losses were 420,000; French losses were 195,000; German casualties numbered nearly 650,000.

The Italian Front

On March 11 the Italians launched the Fifth Battle of the Isonzo. Like its predecessors, this battle was a succession of inconclusive conflicts. The Austrians began a long-planned offensive in the Trentino area on May 15, catching the Italians unprepared. Terrain difficulties and Italian reinforcements finally checked the drive on June 10. An Italian counteroffensive and the need to rush troops to the eastern front caused the Austrians to withdraw to defensive positions. Italian casualties reached more than 147,000; the Austrians lost 81,000 troops.

On August 6, Cadorna again struck the Austrian Isonzo front. In this Sixth Battle of the Isonzo the Italians took Gorizia, but no breakthrough was effected. Psychologically, the operation boosted Italian morale, lowered by the heavy losses in the Trentino.

The Eastern Front

Responding to French appeals, on March 18 the Russians launched a two-pronged drive in the Vilna-Naroch area to counter the German Verdun assault in the west. But the Russian assault soon broke down in the mud of the spring thaw. Its cost—between 70,000 and 100,000 casualties and 10,000 prisoners—did not improve Russian morale. German losses were about 20,000 men.

The Austrian spring offensive against Italy brought another appeal to Tsar Nicholas for help. In response, Gen. Aleksei A. Brusilov, the capable and courageous commander of the Russian Southwestern Army Group, attacked on a 480-km (300 mi) front on June 4. In order to gain surprise, there was no prior massing of troops or preliminary artillery preparation. Well-planned, rehearsed, and executed, the assaults bit through the Austro-German line in two places. Brusilov, however, received little or no aid or cooperation from the two other Russian army groups on the front, and on June 16 a German counteroffensive checked his northern thrust. Again taking the offensive on July 28, Brusilov made further gains, until slowed down by ammunition shortages. His third assault, begun on August 7, brought him into the Carpathian foothills by September 20. The offensive ended when German reinforcements, rushed from Verdun, bolstered the shattered Austrians, who were in danger of being knocked out of the war.

The Brusilov Offensive was the most competent Russian operation of World War I. It weakened the Central Powers' offensives in Italy and at Verdun, contributing to the downfall of Falkenhayn. The Russians, however, had suffered 1 million casualties. The Brusilov Offensive thus contributed to the resentments that produced the Russian Revolutions of 1917. Austrian losses were even greater, and the defeat was the most important element in the disintegration of the Habsburg Empire.

After long haggling with the Allies for a promise of rich territorial gain, Romania was so impressed by the early success of the Brusilov Offensive that it declared war on Germany and Austria on August 27. Romanian armies advanced into Transylvania, where they were repulsed by Falkenhayn, now commanding the Ninth Army. Mackensen, commanding the German-reinforced Bulgarian Danube Army, drove north through the Dobruja and crossed the Danube on November 23. Penned in a salient, Romanian Gen. Alexandru Averescu was disastrously defeated in the Battle of the Arges River (December 1–4). Bucharest was occupied on December 6, and by the year's end the remnants of the Romanian armies had been driven north into Russia, holding one tiny foothold in their own country with belated Russian support. The bulk of Romanian wheat fields and oil wells fell into German hands.

The Balkan Front

The Allied forces now held a fortified position—the "Bird Cage"—around Salonika. French Gen. Maurice P. E. Sarrail was technically in command, but the British took orders from their home government. In July the reconstituted Serbian army, 118,000 strong, arrived by ship, and with additional reinforcements the Allied strength rose to more than 250,000. Sarrail planned an offensive up the Vardar Valley, but on August 17 Bulgar-German attacks initiated the Battle of Florina. The Allied forces were driven back to the Struma River line by August 27. Sarrail's

counteroffensive, launched on September 10, dwindled to a stop as Sarrail bickered with his subordinates.

In Albania active operations began in July. An Italian corps finally pushed an Austrian corps north and linked with Sarrail's main body at Lake Ochrida on November 10.

The Turkish Fronts: The Caucasus, Mesopotamia, Egypt, Palestine, Arabia

General Yudenich, one of the few highly capable Russian commanders, advanced from Kars toward Erzerum on January 11, reaching the city and breaking through its ring of forts in a 3-day battle (February 13-16). Trebizond (Trabzon) was captured on April 18, facilitating Russian logistical support.

Enver Pasha launched the Turkish counteroffensive in late June. Yudenich, moving with characteristic rapidity and judgment on July 2, routed the Turkish Third Army completely on July 25. He then turned on the Turkish Second Army. Kemal, hero of Gallipoli and now a corps commander, scored the only Turkish successes, capturing Mus and Bitlis in August; Yudenich quickly retook them, however. Fighting ceased when both sides retired to winter quarters.

In Mesopotamia, Townshend's besieged force at Kut-el-Amara vainly waited for help. The British suffered 21,000 casualties in a series of unsuccessful rescue attempts, and with starvation near, Townshend capitulated on April 29, surrendering 2,070 British and approximately 6,000 Indian troops.

To divert Turkish forces from Mesopotamia, Russian Gen. N. N. Baratov moved on the Persian town of Kermanshah. He reached Karind on March 12 and advanced on Baghdad. After Kut fell, Turkish commander Halil Pasha shifted his forces, repulsed a Russian attack at Khanikin on June 1, and retook Kermanshah by August. British Gen. Sir Frederick S. Maude, appointed to the Mesopotamian command in August, found himself reduced to a defensive role while possible British withdrawal from the theater was considered. When he received permission to resume the offensive, Maude began movement up both banks of the Tigris on December 13 with 166,000 men, two-thirds of them Indian.

British forces in Egypt, under Gen. Sir Archibald Murray, began an eastward extension of Suez Canal defenses into the Sinai Desert, a complex plan involving the laying of water pipelines, construction of roads and a railway, and fortifications. Several skirmishes occurred in Sinai as British covering troops met Turkish resistance.

On June 5 an Arab revolt against the Turks broke out in the Hejaz. Initially unimpressive, the revolt spread to Palestine and Syria under the leadership of British archaeologist T. E. LAWRENCE, a brilliant tactician who joined forces with HUSAYN IBN ALI. With a force of only a few thousand Arabs, Lawrence succeeded in threatening the Turks' entire line of land communications north through Syria to the Taurus Mountains.

On August 3, German Gen. Kress von Kressenstein, with 15,000 Turkish troops and German machine gunners, struck the British Sinai railhead at Rumani in a surprise attack. He was repelled, and as the year ended a massive British advance was underway.

The War at Sea: The Battle of Jutland

From the beginning of 1916, Germany had made an intensive effort to reduce the size of the British fleet, employing submarines, airships, and mines. The campaign, however, was progressing too slowly, and consequently by spring plans were formulated to lure a portion of the Grand Fleet into an open-seas confrontation, surrounding and destroying the British ships before reinforcements could arrive. The German High Seas Fleet under Vice Adm. Reinhard Scheer put to sea on May 30, led by von Hipper's scouting fleet—40 fast vessels built around a nucleus of five battle cruisers, sailing northward. Well behind was the main fleet of 59 ships. Warned of the sortie by German radio chatter, the Grand Fleet under Adm. Sir John Jellicoe headed toward the Skagerrak. Leading was Beatty's scouting force of 52 ships, including his 6 battle cruisers and Adm. Hugh Evan-Thomas's squadron of 4 new superdreadnoughts. Jellicoe's main fleet, following, was composed of 99 vessels. Overall, the British had 37 capital ships at sea: 28 dreadnoughts and 9 battle cruisers; the Germans had 27 capital ships: 16 dreadnoughts, 6 older battleships, and 5 battle cruisers.

At 3:31 p.m. on May 31, Beatty's two eastbound divisions sighted Hipper's force steaming south. (Hipper had already sighted Beatty and was returning toward the German main fleet.) As Hipper hoped, Beatty turned on a parallel course to the German squadron, signaling Evan-Thomas's dreadnought squadron—which Hipper had not yet sighted—to follow. Both battle-cruiser forces opened fire at a 15,000-m (16,500-yd) range, with the German

gunnery more accurate. Beatty's flagship Lion received several hits, followed by mortal blows to two thin-skinned British battle cruisers, Indefatigable and Queen Mary. Beatty, with only 4 ships left to oppose the German 5, and Evan-Thomas still out of range, tersely signaled, "Engage the enemy closer."

Nevertheless, at 4:42 Beatty sighted the German main fleet approaching; reversing course, he turned north to join Jellicoe, hoping to lure the German fleet toward him. Hipper had already turned and was firing accurately at Beatty's ships and those of Evan-Thomas, who was slow in turning and was now also being pounded by Scheer's main battle line. For over an hour the chase to the north continued, both sides sustaining considerable damage. Shortly after 6 PM, Beatty sighted Jellicoe's six divisions approaching from the northwest in parallel columns, behind Rear Adm. Sir Horace Hood's squadron of three battle cruisers and two light cruisers. Both Jellicoe and Beatty began to swing entirely around Scheer, hoping to block him from his base. Shortly before 6:30, Scheer sighted Hood's squadron to his right front; simultaneously British dreadnought shells began to fall around the German battle line. Within minutes practically every major ship in both fleets was within range and a furious general engagement erupted. The German battle cruisers caught the worst of the storm; Hipper's flagship Lutzow was hammered out of action. On the British side Hood's flagship and two British cruisers were sunk.

The High Seas Fleet was now inside the converging arc of the Grand Fleet and taking heavy punishment. At 6:35, Scheer, under cover of a smoke screen and destroyer attacks, suddenly reversed course by a difficult and perfectly executed simultaneous 180-degree turn, breaking out of the British net and heading west. Jellicoe, instead of pursuing, continued southward, because he knew his fleet was now between the Germans and their bases. Then, at 6:55, Scheer made another 180-degree fleet turn back toward the British, subjecting his ships to the might of almost the entire Grand Fleet. This time it seemed that the Germans could not escape destruction in the hail of great projectiles, but Scheer again made a simultaneous turn away, while four remaining German battle cruisers charged toward the British line to cover the withdrawal. Then, German destroyers sped in toward Jellicoe's battleships to launch a torpedo attack and spread a smoke screen. Jellicoe, overly cautious and wary of torpedoes, turned away. By the time he had resumed his battle line, the German High Seas Fleet had disappeared westward into the dusk as Scheer made another 180-degree turn. Amazingly, none of the German battle cruisers had been sunk in their courageous "death ride."

Although the main battle was over, Scheer knew that the British fleet was heading southward, hoping to trap him as he returned to his home ports. Aware that his fleet could not survive a renewed general battle, after dark Scheer boldly turned to the southeast, deliberately crashing into a formation of light cruisers at the tail of Jellicoe's southbound fleet. He battered his way through in a chaotic midnight battle of collisions, sinkings, and gunfire. By dawn, Scheer was shepherding his crippled fleet toward the Jade anchorage.

The British now turned back to their bases. They had lost three battle cruisers, three cruisers, and eight destroyers; they had 6,784 casualties. The Germans lost one old battleship, one battle cruiser, four light cruisers, and five destroyers; casualties were 3,039.

The Battle of Jutland marked the end of an epoch in naval warfare. It was the last great fleet action in which the opponents slugged it out within eyesight of one another. A drawn battle tactically, it did not change the strategic situation, other than to convince the Germans that they had no chance of defeating the Grand Fleet. In the main, German naval effort was now concentrated on submarine activities. Tremendous toll was taken on Allied shipping: 300,000 tons per month by December.

OPERATIONS IN 1917

Global Strategy

Toward the end of 1916, at another Allied conference called by Joffre at Chantilly, general agreement had been reached to continue a policy of joint Anglo-French large-scale operations on the western front in conjunction with simultaneous Russian and Italian offensives. These would have priority over all operations elsewhere, although the new British prime minister, David LLOYD GEORGE, decided to undertake a major campaign in Palestine as well.

On Dec. 31, 1916, Joffre was retired, and was succeeded by Nivelle. This turn of events immediately complicated Allied coordination. Nivelle, who was planning a giant joint Anglo-French offensive, clashed with Haig about their command relationship. The French government supported Nivelle, and the British were divided. Lloyd George, who distrusted Haig and admired Nivelle, placed the BEF under Nivelle's command, to the horror of Haig and Sir William Robertson, the new chief of the Imperial General Staff. Through this bickering, and Nivelle's own imprudent announcements, secrecy was lost.

In this scenario, public goods have become a political asset because increased efficiency and reduced costs of production have led to increased economic growth. The government's role has shifted from being a provider of basic services to becoming a facilitator of private sector development. This shift in focus has led to a more efficient and effective delivery of services, which in turn has led to improved economic outcomes and greater social welfare. In addition, the shift in focus has also led to a reduction in the cost of providing services, which in turn has led to increased economic growth. As a result, the government's role has shifted from being a provider of basic services to becoming a facilitator of private sector development. This shift in focus has led to improved economic outcomes and greater social welfare.

the following table. The first column lists the names of the species, the second column lists the number of individuals examined, and the third column lists the percentage of infected individuals. The data shows that the infection rate varies significantly between species, with *S. typhimurium* having the highest infection rate at 40%, while *S. enteritidis* has the lowest at 10%.

With the number of visitors to the park increasing year by year, the park management has decided to expand the facilities and services available to visitors. This will involve the construction of a new visitor center, which will feature modern exhibits and interactive displays. The new center will also include a gift shop, a cafe, and a small theater. A modern, comfortable seating area will be provided for visitors to relax and enjoy the views. The park management has also decided to increase the number of guided tours offered, which will provide visitors with a deeper understanding of the park's natural and cultural heritage. The park management is committed to ensuring that all visitors have a safe and enjoyable experience.

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Based on our experience in Mexico, we believe it is important to maintain a healthy mix. We expect 20% of the new job market will come from the migration of rural workers and the remaining 80% will come from urban areas, particularly in cities, as a result of both economic development and population growth. This will represent a significant increase in the number of people available for employment.

Le più importanti sono le leggi di base della fisica, come la legge di gravità universale, la legge della conservazione dell'energia e la legge della conservazione della massa.

Ludendorff, aware of the Allied preparations and realizing the vulnerability of overextended German lines in the west, deliberately chose a defensive attitude on both major fronts while forcing Austria (with German assistance) to take decisive action against Italy, which he believed could be defeated in 1917.

The emperor approved this strategic concept, and also concurred in the inauguration of unrestricted submarine warfare, regardless of American opinion. He virtually granted unlimited authority to the military high command.

United States Entry

When World War I erupted, U.S. President Woodrow WILSON declared that the United States would adopt a policy of strict neutrality. Wilson urged all Americans to be "impartial in thought as well as in action." Past loyalty to France as well as the German invasion of neutral Belgium, however, resulted in the development of a pro-Allied slant in the United States. In addition, Wilson's inner circle contained a number of officials—including Col. Edward M. HOUSE, Wilson's closest advisor—whose partisanship toward the Allied cause was obvious.

When Britain began a blockade of Germany, the Germans countered by establishing a war zone around the British Isles and announcing that their submarines would sink all vessels in the area. By the middle of 1915 a number of relatively minor incidents had occurred with small losses of American lives. American travelers, however, remained undaunted.

The sinking of the Lusitania sent the first shock wave. Wilson strongly protested against what he regarded as needless slaughter. Following the sinking of the British liner Arabic on Aug. 19, 1915, the German government, fearing American involvement in the war on the side of the Allies, agreed to pay indemnities and guaranteed that submarines would not sink passenger liners without warning. Despite this agreement, another passenger ship, Sussex, was torpedoed by German U-boats on Mar. 24, 1916, and several Americans were killed. Germany subsequently announced (May 10) abandonment of the extended submarine campaign. During this period Great Britain, seeking to maintain a blockade, violated American neutrality rights by illegally seizing American vessels with such frequency that Wilson threatened to provide convoys for all American merchant ships.

The 1916 presidential election was one of the closest in American history. The Republicans nominated Justice Charles Evans Hughes over Theodore Roosevelt, whereas the Democrats unanimously renominated Wilson. The Democratic slogan, "He kept us out of war," appealed to voters in the middle and far west, and support for Wilson in these sections enabled him to win reelection.

Then, in a complete about-face, Germany announced resumption of its policy of unrestricted submarine warfare on Jan. 31, 1917. On February 3, Wilson broke off all diplomatic relations with Germany. A month later the Zimmermann note—written by Arthur Zimmermann, the German foreign minister, to the German ambassador in Mexico—was turned over to the U.S. government by British intelligence, who had intercepted and decoded the message. The note indicated that if Germany and the United States were to go to war, Germany would seek an alliance with Mexico—and offer the Mexicans Texas, New Mexico, and Arizona for their efforts against their northern neighbor. This, along with the news that more American ships had been sunk by German submarines, aroused Americans to a warlike stance. By Apr. 6, 1917, Congress approved a war resolution against Germany. War against Austria-Hungary was not declared until 8 months later, on December 7.

The United States was ill-prepared for war. The army numbered barely more than 200,000, and not a single division had been formed. Maj. Gen. John J. PERSHING was selected to command the American Expeditionary Force (AEF) and the First Division, an amalgam of existing regular army units, was shipped to France in June. Pershing's plan called for a 1-million-man army overseas by May 1918, with long-range provision for 3 million men in Europe at a later date. A draft law—the Selective Service Act—was passed on May 18, 1917.

The Western Front

Anticipating an Allied offensive, the Germans withdrew (February 23-April 5) to a highly organized defensive zone—the Hindenburg line, or Siegfried zone—about 32 km (20 mi) behind the winding, overextended line from Arras to Soissons. This new line could be held with fewer divisions, thus providing a larger and more flexible reserve. Behind a lightly held outpost line, heavily sown with machine guns, lay two successive defensive positions, heavily fortified. Farther back lay the German reserves concentrated and prepared for counterattack.

The long-awaited Nivelle Offensive began on April 9 when British troops, following a heavy bombardment and gas

attack, crashed into the positions of the German Sixth Army near Arras. British air supremacy was gained rapidly. Canadian troops stormed and took Vimy Ridge the first day. The British advance was finally halted by April 15, but the next day the French armies assaulted on a 64-km (40-mi) front between Soissons and Reims to take the Chemin des Dames, a series of wooded, rocky ridges paralleling the front. The Germans held the sector, fully cognizant of French plans as a result of Nivelle's confident public boasts of victory.

Immediately before the attack, German fliers swept the sky of French aerial observation and German artillery fire destroyed approaching French tanks. Although the French managed to reach and capture the first German line, repeated attacks gained little ground. The operation was a colossal failure, costing the French nearly 120,000 men in 5 days. German losses, despite 21,000 captured, were much fewer.

Disheartened following the disaster, the exhausted French army mutinied beginning on April 29. The bombastic Nivelle was replaced by Petain on May 15. After a 2-week period, Petain quelled the mutiny and restored the situation with a combination of tact, firmness, and justice. By amazingly efficient censorship control, French counterintelligence agencies completely blotted out all news of the mutiny. By the time Ludendorff finally learned of it, renewed British attacks had already drawn German reserves to the northern front, where Haig had launched an offensive, partly to relieve German pressure on the French and partly because he believed he could now break through the German lines. The Ypres salient was Haig's target, but first the British had to take the dominating Messines Ridge.

On June 7, after a 17-day general bombardment, British mines packed with 500,000 kilograms (1.1 million pounds) of high explosives tore a wide gap in the German lines on the Messines Ridge. Then, under cover of the British air force, Gen. Sir Herbert Plumer's Second Army successfully occupied Messines. Elbowroom had been gained for the main offensive, and the clear-cut victory bolstered British morale.

The bloody Third Battle of Ypres began on July 31 when the British attacked the Germans from the northeast. The low ground, sodden with rain, had been churned to a quagmire by a preliminary 3-day bombardment. Overhead the Allies had won temporary air superiority, but all surprise had been lost by the long preparation, and the German defense was well organized. After some early gains, the advance literally bogged down. In a series of limited assaults on narrow fronts, begun on September 20, the British inched forward against determined counterattacks. For the first time, the Germans used mustard gas, which scorched and burned the British troops. The taking of Passchendaele Ridge and Passchendaele village by Canadian troops on November 6 concluded the offensive. The Ypres salient had been deepened for about 8 km (5 mi), at great cost—approximately 240,000 British and 8,528 French casualties. German losses were estimated at 260,000.

Determined to keep pressure on the Germans to permit French recovery from the mutiny, Haig brought the tank back into action. On November 20, the British Third Army of Gen. J. H. G. BYNG surprised Gen. Georg von der Marwitz's German Second Army positions in front of Cambrai. At dawn approximately 200 tanks, followed by wave after wave of infantry, plowed into the Germans. The German defense collapsed temporarily and the assault bit through the Hindenburg line for 8 km (5 mi) on a 10-km (6-mi) front.

Although two cavalry divisions were poised to exploit the breakthrough, infantry reserves were weak, many of the tanks broke down, and the advance slowed. On November 30, German counterattacks fell on the salient and Haig ordered a partial withdrawal on December 3. Nonetheless, Cambrai marked a turning point in western front tactics on two counts: successful assault without preliminary bombardment and the first mass use of tanks.

The Italian Front

Cadorna, despite promises to aid the Allied offensive, did not actually start until after the battles of Arras and the Aisne were over. On May 12 the Italians again attempted to batter their way over mountainous terrain in the Tenth Battle of the Isonzo. After 17 days gains were small but losses huge: about 157,000 Italian casualties against about 75,000 Austrians.

Cadorna now decided to make a supreme effort. With 52 divisions and 5,000 guns he launched the Eleventh Battle of the Isonzo on August 18. An assault between Gorizia and Trieste was fended off, but north of Gorizia the heavily reinforced Italian Second Army made a clear-cut advance, capturing the strategically important Bainsizza Plateau. The Austrians, close to collapse, asked for German help.

A new Austrian Fourteenth Army (seven of its divisions and most of its artillery were German), under German Gen. Otto von Below, suddenly crashed against the Italian Second Army, sparking the Battle of CAPORETTO (Twelfth

Isonzo) on October 24. Surprise bombardment, with clouds of gas and smoke shells, disrupted Italian signal communications. Then the German assault elements streamed through the zone. The battered Second Army was driven from its defensive lines back across the Tagliamento and Livenza rivers. The Italian Third Army withdrew smoothly along the coast, but part of the so-called Carnic Force on the northern Alpine fringe was trapped.

By November 12, Cadorna had managed to stabilize his defense from Mount Pasubia, south of Trent, along the Piave River to the Gulf of Venice. There, the Austro-German offensive slowly ground to a halt, having outdistanced its supply. The catastrophe cost the Italians 40,000 killed and wounded plus 275,000 prisoners; Austro-German losses were about 20,000. Cadorna was replaced by Gen. Armando Diaz, and French and British reinforcements were moved into Italy to bolster the shaken Italians. A direct result of the disaster at Caporetto was the Rapallo Conference (November 5), which set up the Supreme War Council, the first attempt to attain overall Allied unity of command.

The Eastern Front: Revolution in Russia

On March 12 (February 27, O.S.) the garrison and workers of Petrograd (renamed from St. Petersburg), capital of Russia, mutinied, beginning the RUSSIAN REVOLUTIONS OF 1917. Within 3 days Tsar Nicholas II had abdicated, being replaced by a provisional government of a new Russian Republic. The new regime, bickering with the Bolshevik-dominated Petrograd Soviet (Council of Workers and Soldiers' Deputies), pledged itself to continue war against the Central Powers until Allied victory.

On March 14 the Soviet defied the provisional government and issued the notorious "Order No. 1," depriving officers of disciplinary authority. Broadcast throughout the armed forces, it produced the results desired by the Bolsheviks—breakdown of all military discipline. The Russian army and navy collapsed as threadbare, battle-weary soldiers and sailors murdered or deposed officers. The delighted Germans, halting all offensive movements on the eastern front lest the Russians reunite in defense of the homeland, diverted their troops to the western and Italian fronts. To undermine the provisional government, the Germans smuggled Vladimir Ilich LENIN and other Bolshevik activists into Russia, where Leon TROTSKY joined them.

Despite all the turmoil, Aleksandr KERENSKY, appointed minister of war on May 8, responded to pressure from the alarmed Allies by ordering Brusilov, now commander in chief, to mount an offensive on the Galician front. On July 1, Brusilov attacked toward Lemberg with the few troops still capable of combat operations. After some initial gains, the Russian supply system broke down, and Russian enthusiasm and discipline faded quickly as German resistance stiffened. Gen. Max Hoffmann, commanding on the eastern front, began the German assault on July 19, crushing the demoralized Russian armies. The Germans halted their advance at the Galician border, but on September 1, Gen. Oscar von Hutier's Eighth Army attacked Riga, the northern anchor of the Russian front. As a holding attack on the west bank of the Dvina River threatened the city, three divisions crossed the river to the north on pontoon bridges, encircling the fortress, while exploiting elements poured eastward. The Russian Twelfth Army fled in complete panic, and a small German amphibious force occupied Osel and Dago islands in the Gulf of Riga.

The German victory at Riga left the Russian capital unprotected. The Kerensky government (Kerensky had become head of the provisional government on July 20), which had made the fatal mistake of continuing the unpopular war effort, fled Petrograd for Moscow. On November 7 (October 25, O.S.) the Bolshevik leaders Lenin and Trotsky seized power. Lured by promises of "land, peace, bread," Russian soldiers deserted in droves and the revolutionary government abandoned the war effort on November 26. A truce was signed on December 15, ending hostilities on the eastern front and permanently erasing Russia from the Allied ranks. Lenin, anxious to focus his attention on the burgeoning revolution in Russia, agreed to the harsh Treaty of BREST-LITOVSK (Mar. 3, 1918), whereby Russia recognized the independence of the Ukraine, Finland, and Georgia; gave up control of Poland, the Baltic states, and a portion of Belorussia; and ceded Kars, Ardahan, and Batumi to Turkey. The Ukraine, which remained occupied throughout 1918, provided grain to save the German people from starvation.

The Balkan Front

In Greece, King Constantine's government continued to conciliate the Central Powers. Finally, bowing to Allied pressure, Constantine abdicated on June 12. He was replaced by his son Alexander, who appointed (June 26) Venizelos as premier, and the next day Greece entered the war. The ineffective General Sarrail was replaced by Gen. M. L. A. Guillaumat, who set out to reorganize the Greek forces and plan an offensive.

The Turkish Fronts: Palestine and Mesopotamia

The Russian Revolution eliminated the Caucasus as a consequential war theater early in the year, freeing Turkish troops to support other fronts. On January 8-9, in the Battle of Magruntein, the British cleared the Sinai Peninsula of all organized Turkish forces. Sir Archibald Murray was then authorized to begin a limited offensive into Palestine, where the Turks were established in defensive positions along the ridges between Gaza and Beersheba, the two natural gateways to the region. An attack on Gaza (March 26) led by Gen. Sir Charles M. Dobell failed because of defective staff work and a communications breakdown between Dobell's mounted force and infantry. Murray's report, however, presented this First Battle of Gaza as a British victory, and Murray was ordered to advance without delay and take Jerusalem. On April 17, Dobell attempted a frontal assault and was again thrown back by the now well-prepared Turks. Both Dobell and Murray were then relieved, the latter being replaced by General Allenby, a fighting cavalryman with the gift of leadership and tactical ability. His instructions were to take "Jerusalem before Christmas."

On October 31, Allenby attacked in the Third Battle of Gaza (Battle of Beersheba). Reversing his predecessor's plans, Allenby left three divisions demonstrating in front of Gaza and secretly moved against Beersheba. Surprise was complete, and an all-day battle culminated at dusk in a mounted charge by an Australian cavalry brigade through and over the Turkish wire and trenches into Beersheba itself, capturing the vital water supply. Hastily evacuating, the Turkish Seventh Army now lay with its left flank open.

Allenby struck north on November 6, launching the Desert Mounted Corps across the country toward the sea. The Turks evacuated Gaza in time to avoid the trap, but Allenby, pursuing closely, struck again on November 13, driving the Turks back north. Turning now toward Jerusalem, Allenby was detained by the appearance of Turkish reserves and the arrival of General von Falkenhayn, who reestablished a front from the sea to Jerusalem. Forging ahead, Allenby assaulted the enemy positions on December 8, driving the Turks from the Holy City, which was occupied by the British the next day.

In Mesopotamia, Sir Frederick Maude skillfully assaulted Kut on February 22, forcing the Turks back toward Baghdad. After several days of fighting along the Diyala River, Maude entered the city on March 11, the Turkish forces retreating in some disorder. Maude now launched three exploiting columns up the Tigris, Euphrates, and Diyala rivers, securing his hold on Baghdad.

When the summer heat subsided, Maude struck sharply northwestward up the Euphrates River, pursuing the Turkish survivors into central Mesopotamia. He prepared to continue his advance to the oil fields of Mosul, but died of cholera on November 18. Gen. Sir William R. Marshall succeeded him.

The War at Sea

After careful calculations the German naval command had concluded that unrestricted submarine warfare would force Britain to sue for peace in 5 months. It almost worked. British shipping losses soared to 875,000 tons per month by April. British and neutral merchant sailors began to refuse to sail. Recommendations for instituting convoys were rejected by the Admiralty as an unsound waste of available cruisers and destroyers. The efforts of light warships to sink submarines were disappointing, however. Admiral Jellicoe (now first sea lord) calculated that Britain would be depleted of food and other needed raw materials by July.

The insistence of Prime Minister Lloyd George, combined with the strong recommendations of U.S. Adm. William S. Sims and of Beatty (now commander of the Grand Fleet), finally forced adoption of the convoy system on May 10. The results were spectacular. British escort vessels, joined by American destroyers in May, provided adequate protection to merchant ships and at the same time were able to sink more submarines. Unquestionably the convoys saved Britain. Although shipping losses by the end of the year exceeded 8 million tons, Allied shipbuilding programs more than offset the losses.

In other naval actions German destroyers raided in the English Channel in February, March, and April. In response the British made several raids on Ostend and Zeebrugge. Later in the year the British raided German coastal shipping off Holland and, in November, made an unsuccessful battle-cruiser raid against German minesweeping operations in Heligoland Bight. In December the Germans raided several British-Scandinavian convoys. These raids inflicted serious losses on British merchant shipping, forcing Beatty to use a squadron of battleships as a covering force for future convoys.

OPERATIONS IN 1918

Global Strategy

The Allied situation at the beginning of 1918 was grim. The major Allied offensives of 1917 had failed. Russia had collapsed, and Italy was on the verge of collapse. The German U-boat campaign still threatened the maritime supply route from the United States. Many months would pass before American soldiers could bolster depleted Allied manpower. Both Britain and France were on the defensive.

Nor had the Central Powers been successful. They were being strangled by the Allied naval blockade. Austria was at the end of its resources; Turkey and Bulgaria were wobbling; the burden of the war fell more and more heavily on Germany. Hindenburg and Ludendorff had established a virtual military dictatorship in Germany and exercised almost as much authority over the subservient governments of Austria, Bulgaria, and Turkey.

The American Buildup

The United States, unprepared for war, was faced with organizing, equipping, training, transporting, and supplying an overseas military force. From a strength of 200,000 men and 9,000 officers, the army swelled to more than 4 million men, including 200,000 officers; about half reached Europe before the war ended. Of these, more than half were in combat units—42 divisions of about 28,000 men each—the remainder in supporting roles. Training emphasis was on mobile warfare in offensive combat, with stress on individual marksmanship. Pershing hoped to break out of the constraints of trench warfare.

Pershing and Allied leaders agreed on the Lorraine area east of Verdun as the American combat zone. Supplies from the United States went to ports in southwest France, and movement overland conflicted little with the Allied efforts farther north. Overseas transportation, the province of the U.S. Navy, was in part provided by German merchant vessels seized in American ports, plus an improvised fleet of the American merchant marine. The combined fleet carried more than a million American soldiers to France without loss of a single vessel—on eastbound voyages. (The remaining million sent overseas were transported on Allied ships.)

The 800,000-man U.S. Navy was primarily involved in convoy and other antisubmarine activities, laying 56,000 of the 70,000 mines constituting the North Sea mine belt from Scotland to Norway. Also, a division of five battleships joined the British Grand Fleet and three other battleships operated in Irish waters against surface raiders.

Since the United States was not technically one of the Allies, Pershing was directed that his expeditionary force was to be "a separate and distinct component of the combined forces, the identity of which must be preserved." The Allies, short of manpower and unsure of the inexperienced Americans' military ability, wanted the AEF turned over in toto as a replacement reservoir for the French and British armies, but War Secretary Newton D. BAKER and President Wilson upheld Pershing despite pleas from French premier Georges CLEMENCEAU and Lloyd George.

In an address to Congress on Jan. 8, 1918, President Wilson laid down his famous FOURTEEN POINTS for peace, calling for—among other things open diplomacy, armament reduction, national self-determination, and the formation of a league of nations. These idealistic war aims appeared to give moral weight to the Allied cause.

Operations on the Western Front

Ludendorff realized that Germany's only hope of winning the war lay in a decisive victory in the west in 1918, before American manpower could exercise a significant effect. With Russia out of the war, he was able to shift most German forces from the east to prepare for a major offensive. His intention was to smash the Allied armies in a series of powerful thrusts. Recognizing the divergent interests of the French (concerned with protection of Paris) and the British (interested in their lines of communications with the Channel ports), he intended to drive a wedge between their armies and then destroy the British in subsequent assaults.

The Germans began their drive, the Second Battle of the Somme, at dawn on March 21 in heavy fog, striking the right flank of the British sector on a 100-km (60-mi) front between Arras and La Fere. Following a surprise 5-hour bombardment, specially trained German shock elements rolled through the fog, each division pressing as far and as fast as possible. The stunned British fell back, allowing the German Eighteenth Army to reach and pass the Somme. As British reserves raced to stop the German advance, Haig appealed for French reinforcements, but Petain was more concerned with protecting Paris. The British pressed for a supreme commander, and on April 3 the Allied Supreme War Council, meeting at Beauvais, appointed Ferdinand FOCH as the Allied commander in chief. Immediately he began to send reserves to aid the British.

Meanwhile, the German drive, after gaining 64 km (40 mi), lost momentum. Foch's shifting of reserves checked the

and clear what had VPI to perform in order to meet our clients' requirements and to maintain their confidence in us.

the entire life cycle of the RNA and its progeny must pass through numerous stages before it can be fully understood. Some of the more recent work on the development of the virus has been described by Dr. G. H. Smith, who will speak on "The Development of the Virus in the Host Cell".

REFERENCES AND NOTES

apenas que bate o menor tempo, quando se coloca a pressão de 1000 mmHg, é que o resultado é mais eficiente. Ainda assim, é preciso lembrar que a pressão arterial deve ser medida com calma e com paciência, evitando ansiedade ou tensão.

Although some evidence has been obtained from the analysis of British and continental Latin and other old Italic inscriptions, the main basis seems to be evidence derived from ancient British and most Roman old Italic inscriptions. It is felt to be justified that the linguistic material presented here should be called "old Italic" notwithstanding the fact that it is derived from Latin and from a number of non-Italic languages, and that the term "old Italic" is not used in the same sense as in classical studies, where it denotes evidence which comes from Latin and from a few other Italic languages.

In 2018, a new law was passed in California that requires companies to disclose their use of facial recognition technology, and it is the first state to do so. The law requires companies to provide consumers with information about how their data is used and how it is shared with third parties.

and strict guidelines and their results are gradually being put in place throughout the new entity until all work, media and other areas become more efficient and production will be more effective for both the agencies and the clients.

NOT STRIKING INSTEAD OF COMPLAINING IS A GREAT WAY TO GET A PRACTICALLY FREE AND UNPREDICTABLE EDUCATION. IT'S THE EASIEST WAY TO GET A FREE EDUCATION.

“我已准备好了，你先走吧。”

Another aspect of the cell membrane is that it can only take up what it needs. For instance, ions travel through the cell membrane at different rates of speed, some fast and some slow. This means that certain ions will move across the membrane more quickly than others. For example, calcium ions move across the membrane very slowly, while sodium ions move across the membrane much faster.

and gradually, over years, as I have written, I have come to understand that the best way to live is to consider our actions and our words, to examine our judgments and beliefs, to consider what we are doing, and to take steps to change what we are doing if it is not in accordance with our values.

¹⁰ See also the discussion of the relationship between the concept of ‘cultural capital’ and the concept of ‘cultural value’ in the section on ‘Cultural Capital’ above.

German assault after it reached Montdidier, and Ludendorff brought it to a halt. Allied losses amounted to about 240,000 casualties (163,000 British, 77,000 French); German casualties were almost as high. The most serious consequence of the offensive, from the German point of view, had been the institution of an Allied unified command.

Meanwhile, on March 23, a remarkable long-range German cannon began a sporadic bombardment of Paris from a position 105 km (65 mi) away. This amazing weapon seriously damaged Parisian morale and eventually inflicted 876 casualties, but did not significantly affect the war.

On April 9, in the Battle of Lys, the Germans struck the British sector again, this time in Flanders on a narrower front, threatening the important rail junction of Hazebrouck and the Channel ports. German troops quickly cut through unprepared British divisions and a Portuguese division. On April 12, after announcing, "Our backs are to the wall," Haig forbade further retreat and galvanized British resistance. The German drive was halted on April 17 after gaining 16 km (10 mi), which included the recapture of Messines Ridge. Again, and for the same reasons as before, Ludendorff had achieved tactical success, but strategical failure. There was no breakthrough, and the Channel ports were safe.

Ludendorff struck again—the Third Battle of Aisne—on May 27, this time on a 40-km (25-mi) front along the Chemin des Dames. This action was a diversion against the French, preparatory to a planned decisive blow to be struck against the British in Flanders. German troops, preceded by tanks, routed 12 French divisions (3 of them British), and by noon the Germans were crossing the Aisne; by evening they had crossed the Vesle, west of Fismes, and on May 30 reached the Marne.

On May 28, as Pershing was rushing reinforcements to the French on the Marne, the first American offensive of the war took place at Cantigny, 80 km (50 mi) northwest. Although only a local operation, its success—against veteran troops of Hutier's Eighteenth Army—boosted Allied morale.

At the same time the U.S. Second and Third Divisions were flung against the nose of the German offensive along the Marne, moving into position on May 30. The Third Division held the bridges at Chateau-Thierry, then counterattacked and, with assistance from rallying French troops, drove the Germans back across the Marne. The Second Division checked German attacks west of Chateau-Thierry.

Ludendorff called off his offensive on June 4. The Second Division then counterattacked, spearheaded by its marine brigade. Between June 5 and June 17 the Germans were uprooted from positions at Vaux, Bouresches, and Belleau Wood. A German advance on Compiegne, begun on June 9, was halted by French and American troops on June 12.

Ludendorff, still planning a climactic drive against the British in Flanders, attempted one more preliminary offensive in Champagne to lure French troops away from the British front. The Second Battle of the Marne began on July 14-15 when the Allies, warned of the blow by deserters, aerial reconnaissance, and prisoners, battered the advancing Germans with artillery. East of Reims the attack was halted within a few hours by the French. West of Reims approximately 14 divisions of the German Seventh Army crossed the Marne, but American forces snubbed the attack there. Then Allied aircraft and artillery destroyed the German bridges, disrupting supply and forcing the attack to halt on July 17. In the space of 5 months the Germans had suffered half a million casualties. Allied losses had been somewhat greater, but American troops were now arriving at a rate of 300,000 a month.

As Ludendorff prepared to pull back, the Allied counteroffensive began on July 18. The French armies, using light tanks and aided by U.S. and British divisions, assaulted the Marne salient from left to right, reaching the Vesle River and recapturing Soissons. Ludendorff now called off his proposed Flanders drive, concentrating on stabilizing the situation along the Vesle. The Marne salient no longer existed. Strategically, the Second Battle of the Marne turned the tide; the initiative had been wrested from the Germans. Ludendorff's gamble had failed.

On August 8, near Amiens, Haig threw his Fourth Army and the attached French First Army against the German Eighteenth and Second armies. The Germans, caught off guard by a well-mounted assault, began a panicky withdrawal. Ludendorff bitterly declared that August 8 was the "Black Day of the German Army." He later added: "The war must be ended!"

The Germans managed to reestablish a position 15 km (10 mi) behind the former nose of the salient, but on August 10, French troops forced the evacuation of Montdidier.

On August 21 the British and French armies renewed the assault in the second phase of the Battle of the Amiens. Ludendorff ordered a general withdrawal from the Lys and Amiens areas, but his plans were disrupted when the Anzacs penetrated across the Somme on August 30-31. The entire German situation deteriorated, necessitating retreat to the final position—the Hindenburg line. By this time Haig had expended his reserves and could not further exploit his victory. German casualties were more than 100,000, including about 30,000 prisoners. Allied losses were 22,000 British and 20,000 French. Tactically and strategically, the Allies had gained another major victory; German morale plummeted.

On August 30, Pershing, having won his fight for a separate and distinct U.S. army operating on its own assigned front, moved toward the Saint-Mihiel salient, which the Germans had occupied since 1914. Supported by an Allied air force of about 1,400 planes—American, French, Italian, and Portuguese—under U.S. Col. Billy MITCHELL, the U.S. First Army attacked both faces of the salient on September 12. The assault was completely successful; the salient was entirely cleared by September 16, and Pershing at once turned to the tremendous job of shifting his entire army to another front. More than 1 million men, with tanks and guns, had to be moved 100 km (60 mi)—entirely at night—to the area of the Argonne Forest, west of the Meuse River, and made ready to start another major offensive.

Foch planned two major assaults. One was to be a Franco-American drive from the Verdun area toward Mezieres, a vital German supply center and railroad junction. The other was a British offensive between Peronne and Lens, with the railroad junction of Aulnoye as its objective. If successful, this double penetration would jeopardize the entire German logistical situation on the western front. After the Americans swept through Vauquois and Montfaucon on September 26-27, their drive slowed as the Germans rushed in reinforcements. Replacing a number of his assault divisions with rested troops from the Saint-Mihiel operation, Pershing renewed the offensive on October 4. No room for maneuver existed; the First Army battered its way slowly forward in a series of costly frontal attacks, but the Argonne Forest was cleared, facilitating the advance of the French Fourth Army, on the left, to the Aisne River.

French Prime Minister Clemenceau, exasperated by the slow progress of the Americans, attempted unsuccessfully to have Pershing relieved. Foch, aware that the American offensive was drawing all available German reserves from the rest of the western front, declined to support Clemenceau. As October ended, the First Army had punched through most of the third and final German line.

With rested divisions replacing tired ones, the First Army advanced again on November 1, smashing through the last German positions northeast and west of Buzancy, thus enabling the French Fourth Army to cross the Aisne. In the open now, American spearheads raced up the Meuse Valley, reaching the Meuse before Sedan on November 6 and severing by artillery fire the Mezieres-Montmedy rail line, a vital supply artery for the entire German front. On September 27, a day after the beginning of the American offensive, Haig's army group flung itself against the Hindenburg line; but his drive soon slowed down, however, in the face of skillful German defense.

Because of American pressure in the Meuse-Argonne, a German retreat all along the line became necessary. In a renewed assault, the British broke through German defenses on the Selle River on October 17. At the same time the Belgians and British under the Belgian king Albert began to move again in Flanders. The German army began to crack.

On October 6, as the front lines began to crumble, the new German chancellor, Prince Max, of Baden, sent a message to President Wilson, requesting an armistice on the basis of Wilson's Fourteen Points. An exchange of messages was concluded on October 23 with Wilson's insistence that the United States and the Allies not negotiate an armistice with the existing military dictatorship of Germany. Immediately before formal dismissal, Ludendorff resigned on October 26 to permit the desperate German government to comply with Wilson's demand. Hindenburg, however, retained his post as German field commander, with Gen. Wilhelm GROENER replacing Ludendorff as quartermaster general, or chief of staff.

Revolution and Armistice

Inspired by the Communists and sparked by a mutiny of the High Seas Fleet, which erupted on October 29, revolts flared inside Germany. A new socialist government took power and proclaimed a republic on November 9. The emperor fled to the Netherlands the next day.

Meanwhile, a German delegation, headed by civilian Matthias Erzberger, negotiated an armistice with Foch in his railway-coach headquarters on a siding at Compiegne. Agreement was finally reached at 5:00 AM, Nov. 11, 1918.

The terms specified that the German army must immediately evacuate all occupied territory and Alsace-Lorraine; immediately surrender great quantities of war materiel; surrender all submarines; and intern all other surface warships as directed by the Allies. In addition the Germans were to evacuate German territory west of the Rhine, and three bridgeheads over the Rhine were to be occupied by the Allies. The armistice became effective immediately; hostilities ceased at 11:00 AM on November 11.

Although the AEF was a vital factor in the final Allied victory, the American role was primarily to add a final increment of numbers and fresh initiative, permitting the much larger and more experienced Allied armies to achieve equally spectacular successes in the final weeks of the war.

The Italian Front

During the spring Germany transferred its troops in Italy to the western front, insisting that the Austrians crush Italy single-handedly because Russia was out of the war. Following a diversionary attack in the west at the Tonale Pass, which was repulsed on June 13, Austrian drives toward Verona and Padua were similarly checked. Diaz, marking time until certain of Allied success on other fronts, finally prepared a double offensive. (By this time the Austro-Hungarian government was requesting an armistice.) The Italians attacked on October 24 in the Battle of Vittorio Veneto but were quickly halted on the Piave River line. French troops, however, clawed a footing on the left, and British troops gained a large bridgehead on the right, splitting the front by October 28. The penetration reached Sacile on October 30. The next day, as Italian reinforcements exploited the ever-widening gap, Austrian resistance collapsed. Belluno was reached on November 1 and the Tagliamento on the next day, while in the western zone British and French troops drove through to Trent on November 3. That same day Trieste was seized by an Allied naval expedition in the Gulf of Venice, and a few hours later an armistice was signed. Hostilities ended on November 4.

The Balkan Front

At Salonika the brilliant French general Franchet d'Esperey succeeded Guillaumat in July. Grudgingly the Supreme War Council agreed to allow him to mount a major offensive. He nominally commanded nearly 600,000 men—Serb, Czech, Italian, French, and British—but only about 350,000 were available for duty. Opposing him were about 400,000 Bulgars. Practically all German troops had been withdrawn except for command and staff.

Covered by heavy artillery support, Serbian troops attacked the center of the front on September 15, flanked by French and Greek forces. The penetration was successful, as was a British diversionary attack on the right on September 18.

Gaining momentum, the assault reached the Vardar on September 25, splitting the Bulgarian front. The British drive reached Strumitsa the next day, and French cavalry, passing through the main effort, took Skopje on September 29. Allied air forces created panic among the fleeing Bulgars.

On September 29 the Bulgarians asked for and received an armistice, but Franchet d'Esperey kept his troops moving north. On November 1 they crossed the Danube at Belgrade and were prepared to march on Budapest and Dresden when Germany's armistice halted hostilities.

The Turkish Fronts: Palestine, Syria, and Mesopotamia

During the early part of the year Allenby at Jerusalem was restricted to minor operations because of drafts on his force to the western front. To the south and east, however, Arabia was in flames. T. E. Lawrence, with a small group of British officers, reaped a harvest from the Arab rebellion against Turkish rule. Lawrence's guerrilla forces regularly raided the Hejaz Railway, running approximately 970 km (600 mi) from Amman, Palestine, to Medina in Arabia, the southernmost Turkish garrison. In all, Lawrence's activities kept more than 25,000 Turkish troops pinned down to blockhouses and posts along this line.

By September, Lawrence, with Emir FAISAL, son of Husayn ibn Ali, self-styled "King of the Hejaz," had isolated Medina by destroying the railway line and was moving north to operate on Allenby's right flank.

Meanwhile, Allenby had been reinforced during the late summer. He prepared meticulously for what was to be the decisive blow. The Turkish defensive line, skillfully fortified, lay from the Mediterranean, north of Jaffa, to the Jordan Valley. Allenby's plan was to mass his main effort on the seashore, burst open a gap, and then let his cavalry corps through while the entire British line swung north and east like a gate, pivoting on the Jordan Valley.

Utmost secrecy was kept. At 4:30 AM on September 19 the offensive began. An infantry attack tore a wide gap along the seacoast, through which poured the Desert Mounted Corps. At the same time the Royal Air Force bombed rail junctions and all Turkish army headquarters, completely paralyzing communications. By dawn on September 20 the Turkish Eighth Army had ceased to exist, and the Seventh was falling back eastward in disorder toward the Jordan. The British cavalry then swept through Nazareth and turned east to reach the Jordan just south of the Sea of Galilee on September 21. On the desert flank to the east Lawrence and Faisal cut the railway line at Deraa on September 27, while Allenby pressed to take Damascus on October 1 and Beirut the next day. The Desert Mounted Corps continued to spearhead the advance, reaching Horns on October 16 and Aleppo on October 25. Within 5 days Turkey had signed an armistice at Mudros, ending the war in the Middle East.

Allenby's victory at Megiddo was one of the most brilliant operations in the history of the British army. In 38 days Allenby's troops advanced 580 km (360 mi), taking 76,000 prisoners (4,000 of them Germans and Austrians).

In Mesopotamia a British force under Lt. Gen. A. S. Cobbe was hurriedly pushed north from Baghdad on October 23 to secure the Mosul oil fields before the expected Turkish collapse. After a sharp fight at Sharqat on October 29, Cobbe hurried his cavalry to the outskirts of Mosul on November 1. Despite the provisions of the October 30 armistice, Cobbe was ordered to take the place. After some squabbling, the Turkish garrison of Halil Pasha agreed to march out and the British remained.

The entire checkered Mesopotamian campaign had hinged on possession and protection of the oil fields. The war's end found them in Britain's hands, at a total cost of 80,007 casualties. On November 12 the Allied fleet steamed through the Dardanelles, arriving off Constantinople (Istanbul) the next day, dramatizing the collapse of the Ottoman Empire.

The War at Sea

By early 1918, German submarine warfare had been contained by the Allied convoy system. It was, nevertheless, still a menace. U-boats operated from bases at Zeebrugge, Ostend, and Bruges.

British Rear Adm. R. J. B. Keyes, commanding the Dover Patrol, organized a raid against the bases. On April 22-23 the light cruiser *Vindictive* dashed into Zeebrugge, with destroyer and submarine escort. At the same time a British submarine loaded with high explosives was blown up against the lock gates and two blockships were also sunk. The *Vindictive* escaped after inflicting some damage, but the base was not entirely sealed. A simultaneous raid against Ostend failed, but a later sortie (May 9-10) to block Ostend was partially successful.

The German battle cruiser *Goeben* and light cruiser *Breslau* sailed into the Aegean Sea on January 20, but the voyage ended in disaster; the *Goeben* was badly damaged by British mines, and the *Breslau* was sunk. The *Goeben*, however, was saved despite British aerial bombing.

As Germany approached collapse, German commanders planned a desperate sortie to provoke a final battle with the British Grand Fleet, but on October 29 the crews mutinied and seized control of the warships, ending the war at sea.

Operations in East Africa

Despite intensive efforts the British were unable to overcome the elusive Paul von Lettow-Vorbeck during 4 years of continuous search and pursuit. They drove him into Portuguese East Africa in 1917, where he continued an active and aggressive guerrilla campaign, capturing Portuguese military posts and maintaining his small command by captured supplies. He then reentered German East Africa and, although he had only 4,000 men and was opposed by forces totaling 130,000, he succeeded in capturing several small posts before marching into British Northern Rhodesia. Finally, after the British were able to inform him of the armistice, he ended hostilities on November 14 and surrendered his command on November 23.

Post-armistice

On November 17, under the terms of the armistice, Allied troops began to reoccupy those portions of France and Belgium that had been held by the Germans since 1914. Allied and U.S. troops followed the withdrawing Germans into Germany. On December 9, Allied troops crossed the Rhine into the bridgeheads agreed in the armistice. The British were at Cologne, the Americans at Coblenz, and the French at Mainz. Meanwhile, on November 21 the German High Seas Fleet sailed into the Firth of Forth, between the lines of the British Grand Fleet. It later was

shifted to Scapa Flow.

Cost of the War

The cost of the war in human lives and resources is shown in the table that follows the text of the article.

THE PEACE TREATIES

The First Debate at Versailles

The peace conference at Versailles (see PARIS PEACE CONFERENCE) opened officially on Jan. 18, 1919. In attendance were 70 delegates, representing 27 victorious Allied powers. Neither Germany nor the new Russian Soviet republic were represented. The principal participants in the conference were the leaders of the four great powers: Woodrow Wilson of the United States, Georges Clemenceau of France, David Lloyd George of Britain, and Vittorio ORLANDO of Italy. It soon became apparent that they had widely divergent motives and interests.

Wilson was, at least at the outset, determined on implementing his Fourteen Points, which had been the basis for the armistice negotiations. Principally, Wilson was most intent on the establishment of a League of Nations, which would provide a basis for orderly international relations and the preservation of peace.

Clemenceau was a tough, determined, and skillful politician. He was also a vengeful old man, who had seen much of France ruined, the flower of French manhood consumed in the horrendous war, and who could personally remember the harsh peace terms that Germany had imposed on his country after the Franco-Prussian War. He was determined not only that Germany should suffer, but that the peace terms should make it impossible for Germany to wage war ever again.

Lloyd George was also a skilled politician. Although generally inclined to make a practical, moderate peace, he had been elected on the basis of promises that Germany and its war leaders would be punished. In general he distrusted Wilson's idealism and was determined that none of the Fourteen Points should be allowed to interfere with Britain, its traditional policies, or its commitments to others.

Orlando, the least important of the so-called Big Four, was determined that Italy receive the huge territorial rewards that had been promised in 1915 to lure Italy into the war on the Allied side.

On January 25 the conference unanimously adopted a resolution to establish the LEAGUE OF NATIONS. Then, after a committee was appointed to draft the Covenant of the League, the peace terms were hammered out by the Supreme Council, which consisted of the heads of government and foreign ministers of the five principal Allied powers: the United States, Britain, France, Italy, and Japan.

Slowly and painfully, after 3 1/2 months of argument, the Allied leaders reached compromise solutions on all of the issues and secured the agreement of the smaller powers in matters in which they were concerned. By May 6 the Treaty of Versailles was finally ready to present to Germany.

The Treaty of Versailles

The Covenant of the League of Nations was made an integral part of the treaty, and every nation signing the treaty had to accept the world organization. The League was intended to provide a mechanism for the peaceful settlement of disputes, for the promotion of world disarmament, and the general betterment of humankind.

Except for the return of Alsace-Lorraine to France, which was agreed to unanimously, all of the important treaty provisions regarding German territory were compromises. Allied occupation of the Rhineland was to continue for at least 15 years, and possibly longer, and the region was to remain perpetually demilitarized, as was a belt of territory 50 km (30 mi) deep along the right bank of the Rhine. Three smaller frontier regions near Eupen and Malmedy were to be ceded to Belgium. Parts of the German provinces of Posen and West Prussia were to be given to Poland to provide that revived nation with access to the Baltic Sea; the Baltic seaport of Gdansk (Danzig) was to become a free state but linked economically to Poland. This POLISH CORRIDOR to the Baltic left East Prussia completely separated from the rest of Germany.

All of Germany's overseas possessions were to be occupied by the Allies but were to be organized as "mandates," subject to the supervision and control of the League of Nations. Britain and France divided most of Germany's

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some additional material provided by the author, such as the author's own report on how difficult they will

CHAPTER 3: LITERATURE

REFERENCES AND CITATIONS

replies of the most effective measures for managing traffic flow are very difficult to come by, and a great number of them have emerged related to the area of traffic engineering. In particular, there are several approaches which can be used to reduce traffic volume, either by encouraging people to leave their cars at home or by providing incentives for car manufacturers to produce more fuel-efficient vehicles. These can be made available through education and regulation, such as fuel economy standards or CAFE, RMR or city laws.

For example, one way of reducing traffic volumes is to implement a better public transport system, as well as better cycling infrastructure, such as bike lanes, more reliable bus services, and incentives for people to use them. Another way is to encourage people to leave their cars at home, such as through carpooling schemes, or by increasing the cost of parking in urban areas.

However, it is also important to take into account the needs of individuals and the local environment, such as reducing pollution levels, conserving energy and maintaining local flora and fauna. It is also important to consider the needs of different groups of people, such as children, elderly, disabled, and pregnant women, as well as those who may have specific health conditions. This requires a holistic approach, taking into account the needs of all individuals, as well as the needs of the local environment, such as reducing pollution levels, conserving energy and maintaining local flora and fauna.

In conclusion, traffic management is a complex and challenging field, requiring a multidisciplinary approach, involving a range of different disciplines, such as engineering, psychology, economics, and social sciences. It is also important to take into account the needs of different groups of people, such as children, elderly, disabled, and pregnant women, as well as those who may have specific health conditions. This requires a holistic approach, taking into account the needs of all individuals, as well as the needs of the local environment, such as reducing pollution levels, conserving energy and maintaining local flora and fauna.

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African colonies, and Japan took over the extensive island possessions in the South Pacific.

The treaty required Germany to accept sole responsibility and guilt for causing the war. The former emperor and other unspecified German war leaders were to be tried as war criminals. (This provision was never enforced.)

A number of other military and economic provisions were designed not only to punish Germany for its war guilt, but also to insure France and the rest of the world against the possibility of future German aggression. The German army was limited to 100,000 soldiers and was not to possess any heavy artillery, the general staff was abolished, and the navy was to be reduced. No air force would be permitted, and the production of military planes was forbidden.

Germany was to pay for all civilian damages caused during the war. This burden, combined with payment of REPARATIONS to the Allies of great quantities of industrial goods, merchant shipping, and raw materials, was expected to prevent Germany from being able to finance any major military effort even if it were inclined to evade the military limitations.

The Second Debate at Versailles

On April 29 a German delegation headed by Graf Ulrich von Brockdorff-Rantzau, the German foreign minister, arrived at Versailles. On May 7 the members of the delegation were summoned to the Trianon Palace at Versailles to learn the treaty terms. After carefully reading the treaty, Brockdorff-Rantzau denounced it. He reminded the Allied leaders that the Fourteen Points had provided the basis for the armistice negotiations and thus were as binding on the Allies as on Germany. He insisted that the economic provisions of the treaty were impossible to fulfill.

Although refusing to sign the treaty, the German delegation took it back to Berlin for the consideration of the government. Chancellor Philipp SCHEIDEMANN also denounced the treaty. The Allies had maintained their naval blockade of Germany, however, and after long and bitter debates in Berlin, it became obvious that Germany had no choice but to sign the treaty. Scheidemann and Brockdorff-Rantzau resigned on June 21. That same day, at Scapa Flow, the German High Seas Fleet staged a dramatic protest. Despite every conceivable British precaution, the German sailors scuttled each of their 50 warships in the harbor.

On June 28 the new German chancellor, Gustav Bauer, sent another delegation to Versailles. After informing the Allies that Germany was accepting the treaty only because of the need to alleviate the hardships on its people caused by the "inhuman" blockade, the Germans signed.

The Other Treaties

On September 10 representatives of the now tiny republic of Austria signed the Treaty of Saint-Germain, just outside Paris. The once great Habsburg empire had completely disintegrated in October and November 1918. The treaty, therefore, merely legalized the disappearance of the Austro-Hungarian Empire. Austria recognized the independence of Czechoslovakia, Poland, Yugoslavia, and Hungary; it also recognized the award of Galicia to Poland, and of the Trentino, South Tyrol, Trieste, and Istria to Italy. The Austrian army was limited to 30,000 men, and Austria agreed to pay economic reparations to Allied nations that had been victims of Austro-Hungarian aggression. Austria was forbidden to unite with Germany, as many people of both countries had envisioned.

On November 27, Bulgaria signed a treaty with the Allies at Neuilly, another suburb of Paris. Bulgaria recognized the independence of Yugoslavia, and agreed to cede territory to Yugoslavia, Romania, and Greece. Bulgaria's army was restricted, and the country was forced to pay reparations to its Allied neighbors.

Hungary signed the Treaty of Trianon at Versailles on June 4, 1920, which reduced the country in area from 283,000 sq km (109,000 sq mi) to less than 93,000 sq km (36,000 sq mi). The Hungarian army was limited to 35,000 troops, and reparations were demanded, although the amount was unspecified.

Because of a number of complications, the peace settlement with Turkey was long delayed. When finally signed—at Sevres, another suburb of Paris, on Aug. 10, 1920—it was somewhat meaningless, because Turkish strongman Mustafa Kemal Pasha was leading a nationalist movement and establishing a powerful and proud government. After reconquering Turkish Armenia, which had become independent, and after ejecting a Greek army from Turkey in a brilliant campaign, Mustafa Kemal reoccupied Thrace, or European Turkey, which had been given to Greece by the Treaty of Sevres. He then informed the Allies that he was willing to accept most of the other

provisions of the original peace settlement, consistent with the Fourteen Points. The Allies, having no desire for a new war, and accepting the reasonableness of the Turkish position, agreed.

By the Treaty of Lausanne (see LAUSANNE, TREATY OF), signed on July 24, 1923, Turkey recognized the independence of the Arab Kingdom of Hejaz, the French mandate over Syria, and the British mandates over Palestine and Mesopotamia. Turkey also recognized Greek and Italian occupation of most of its former Aegean islands and agreed to demilitarize the straits, retaining the right to close them in time of war. Turkey was to pay no reparations. It was a fair and responsible treaty that left Turkey better off than it had been before the war, because all of the territories lost were really non-Turkish and had been perpetual military and economic problems for the old empire.

In the United States, despite President Wilson's efforts, the Senate failed to ratify the Versailles peace agreement. As a result the United States arranged separate treaties with Germany, Austria, and Hungary.

TECHNOLOGY GOES TO WAR

More major military technological innovations occurred during World War I than in any other war in history. With the single important exception of the atomic bomb, all of the important means of warfare of World War II were merely improvements or modifications of weapons in use in 1918.

Aircraft and Air Warfare

Although balloons had been used in earlier wars—such as the U.S. Civil War and the Franco-Prussian War—serious directed and controlled flight above the ground was less than a decade-and-a-half old when World War I broke out. At first two varieties of aircraft were used: the rigid, lighter-than-air dirigible balloon, or airship, and the heavier-than-air airplane. The best known and most successful type of dirigible airship was the German Zeppelin. The airplanes were greatly improved versions of the crude prototype first flown (1903) in the United States by the Wright brothers.

The Germans used their Zeppelin dirigibles in a number of high-altitude raids on Paris and London, but long before the end of the war the Germans abandoned mass Zeppelin raids because rapidly improving Allied airplanes were able to climb to the same altitude, and by firing tracer machine-gun bullets into the hydrogen-filled gas bags of the dirigibles, turn them into aerial holocausts. Zeppelins were used for long-distance transportation—one memorable nonstop flight from Bulgaria took much-needed supplies to the tiny isolated German army of General von Lettow-Vorbeck in East Africa—but by the end of the war the Zeppelin had been eclipsed by the combat airplane.

The air war, for all its color, romance, and glory, had little influence on the outcome of World War I. For the most part, aerial warfare consisted of a number of individual combats, bearing little relation to the course of the great ground battles. Bombing did not seriously damage any war industry, and communications and supply lines on the ground were never disrupted to any important extent. Basically, the air war of 1914–18 was a forerunner of things to come and a proving ground for tactical and technical theory.

The Submarine

The first efforts toward submarine warfare were pioneered by Americans in the Revolutionary and Civil wars. Truly effective military submersibles, however, made their appearance in World War I.

Before 1914 a few German naval thinkers had seen the potential of the submarine as a means of offsetting Britain's worldwide dominance of the sea by harassing and attempting to block Great Britain's vulnerable overseas lines of communications.

It almost worked. The submarine campaign of 1917 very nearly forced Britain out of the war, but the convoy system saved Britain, and ultimately the submarines were no longer a serious threat.

The Tank

As dramatic and important a new weapon as the airplane and the submarine, the tank also demonstrated a potential that would come to be fully realized only in subsequent warfare. By the end of World War I the tank was becoming a major force in ground battles. It was slow, cumbersome, and vulnerable to hostile artillery, but it could provide mobility and firepower to the attacker.

Poison Gas

Poison gas was, largely because of its stealth and its asphyxiating fumes, the most terror-inspiring of all weapons of the war. Countermeasures soon reduced poison gas to little more than a means of harassment, but its deadly potential led to an international agreement, the Geneva Protocol of 1925, banning poison gas as a means of warfare.

The Machine Gun

Like the airplane and the submarine, the machine gun was an American invention that was improved in Europe. Early in World War I its value as a defensive weapon was demonstrated. In combination with trenches, barbed wire, and high-explosive artillery shells, the machine gun dominated the long stalemate of the trenches between late 1914 and early 1918.

The Germans ultimately recognized the offensive potential of the machine gun and pioneered the development of light machine guns to provide mobile firepower within every squad.

Artillery and High Explosives

Smoothbore cannon had dominated the battlefields of Europe in Napoleonic times. That dominance had suddenly and dramatically disappeared in the U.S. Civil War, as the rifled musket became the most lethal weapon on the battlefield. Three new developments, however, immediately before World War I restored artillery to its place as the arbiter of battles. These were the accurate, quick-firing field gun with sophisticated recoil mechanism and fast-locking breachblock; high-explosive shells, which could sweep large areas with destructive blasts and jagged splinters of steel; and perhaps most important, new means of rapid communication by telephone, which permitted guns to be placed behind ridge lines and forests and fired over these masks at targets the gunners could not see, by following telephoned directions from easily concealed observers at the front lines.

Tube artillery weapons also approached their full potential of lethality during World War I. The French 75mm field gun, developed in 1897—the most effective artillery piece of the war—remained a useful weapon when World War II broke out in 1939; the German long-range gun that shelled Paris in early 1918 had one of the longest firing ranges of any ballistic cannon.

Electronic Communications

Field telephones not only revitalized artillery, but they provided instantaneous communication between commanders and subordinate units. Although the wires were vulnerable to hostile artillery fire and could be cut by daring night patrols, efficient repair crews could keep the telephones operating under almost any conditions.

A new means of electronic communication also appeared during World War I, barely 10 years after its invention—the radio. Its invisible signals could not be cut by artillery fire or wire cutters, although means of jamming transmission were soon found—and just as soon evaded. Radio permitted much more rapid installation of communications, at far longer ranges, than was possible with field telephones. Few improvements have been made in field telephones since World War I; improvements in radio transmission, however, have been continuous, with the future potential of electronics in warfare still unlimited.

Aftermath

The increased technology of World War I had greatly expanded humankind's potential for killing, but it was also hoped that this "war to end all wars" had served as a lesson to nations and that future bloodshed could be avoided. The League of Nations was established to settle international disputes peaceably, and the Kellogg-Briand Pact (1928) sought to outlaw war completely. Many aspects of the peace settlement at Versailles, however, sowed the seeds of future conflict. The harsh penalties levied against Germany created economic and political instability and thus assisted the rise of Adolf Hitler. As the outbreak of World War II 20 years later would prove, humanity had not yet found the means to peace.

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